AVIATION

The Oldest American Aeronautical Magazine

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VOLUME XVIII

NUMBER 22

SPECIAL FEATURES

THE DOUGLAS TRANSPORT

THE MOREHOUSE LIGHT PLANE ENGINE

NATIONAL AIR TRANSPORT, INC., FORMED

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225 FOURTH AVENUE, NEW YORK

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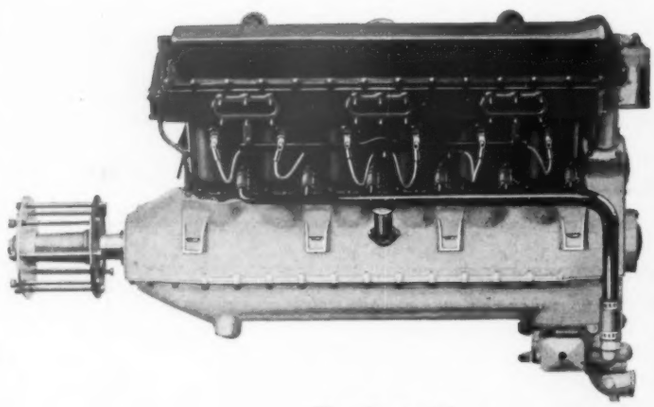

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JUNE 1, 1925

AVIATION

VOL. XVIII. NO. 22

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VOL. XVIII JUNE 1, 1925 No. 22

A Welcome Newcomer

ANOTHER milestone in the history of American aviation was set up this week when the National Air Transport operating company was organized. Heretofore, the three requisites that have been essential to the success of airlines have been lacking in some measure. The first of course is ample financial backing. Equally necessary is experienced management. While these two have been available, the third has seemed to be absent in the form of modern and efficient aircraft. The new company appears to have all three of these important factors.

The list of men interested in the enterprise can command any amount of capital required for the extension of air transport service. Col. Paul Henderson has at his command the most experienced aerial management that could be found anywhere in the world. And what is of even greater importance it is planned to use aircraft that embody the latest aerodynamical characteristics and power plants so that the greatest economy can be secured. With these elements available, the possibility of airplanes making money in transportation work will have its first real test in the world.

Very wisely the new company is planning to carry only the mail and express. Not a word has been said about passengers. By taking this course there can be eliminated the one greatest danger to the new line. A crash on a passenger airline is a blow to revenue that is very difficult to overcome. To the carrying of packages faster than any other method now known will be added the advantages of night service which is indispensible when in competition with night train serve. No doubt, the impressive list of capitalists and aviation experts who are interested in the new transport company will command the greatest respect from the business world. Confidence of this kind is needed when industry has to decide whether or not it will entrust its valuable papers and packages to the air. In securing traffic this element will be of the greatest assistance.

As competition is always a healthy stimulus in commercial work, it is interesting to learn that the Ford airline will be run independently of the new company. Two other enterprises are also in the offing, so it would seem that 1925 will demonstrate in a way that promises the greatest success to the commercial utility of aircraft.

Why 200 Hp. for Training

THERE are certain mysteries connected with army and navy aviation but one of the greatest is the use of training planes with engines developing from 150 to 200 hp. There are those who argue that to really get the feel of a ship one must learn to fly in a machine that is underpowered. Others claim that one must have an extremely responsive machine with lots of reserve power and speed. Both schools of thought have their merit but whichever wins out is immaterial to the point of this editorial as either kind of machine can be built around an engine of less than 100 hp. The "Jenny" is underpowered, but there has been a tremendous advance in aerodynamics and in the knowledge of how to use materials since the JN was first designed. Also a modern engine of 100 hp. would weigh considerably less than an OX. It is almost indisputable that a two-seater of today would have plenty of reserve power and speed. As further proof the three-seater commercial planes with their OX engines have plenty of reserve and the DeHaviland "Moth" with a 60 hp. engine seems to be able to do all the things which our planes of much greater horsepower are able to do.

Within limits the original cost of planes rises directly with their weight and the cost of engines rises with their horsepower. The operating and maintenance of planes also depends on their size so that it is safe to say that for the same amount of money, a considerably greater amount of flying can be done with 100 hp. planes than with 200 hp. planes. In short while on the one hand President Coolidge is preaching economy and the Army and Navy are demanding a reserve of civilian pilots, both branches are designing and having built training planes of continuously larger power plants which are more expensive to build and will increase considerably the cost of training new pilots or of maintaining reserve pilots in good flying condition.

Misplaced Economy

THE Army has a large surplus of Liberty engines more than it can use in years of peacetime service. These engines have a welded steel water jacket and the fact that these were originally made too thin is probably the most serious defect of the Liberty engine. Even with the most careful storage these jackets will rust through and it is almost as difficult to reinforce the jacket as it is to build a new cylinder. With the most laudable intention of economizing and using the Liberty engine for years to come the Army has tried the expedient of building air cooled cylinders for the Liberty engine. The necessary experimental work has been going on at McCook Field for some time and the finished engine has been tested out quite successfully. However, even the men in charge of the work admit that air cooled cylinders will not bring the Liberty engine up to the standard of modern aeronautical engines. It seems rather shortsighted economy to force the Army to use parts of engines which are obsolescent especially when this work is expensive and the spending of an equal amount would materially help in the development of another modern airplane engine.

National Air Transport Organized

Impressive List of Financiers Form $10,000,000 Operating Company

The most ambitious attempt to promote air transportation in this country was announced from Chicago on Thursday, May 21, when the organization meeting of the National Air Transport, Inc., was held at the Drake Hotel in that city. The company is capitalized at $10,000,000, $2,000,000 of which has been sold to the organizers of the company. It was the original plan to issue only $1,500,000 of stock but this was increased. It is definitely asserted that no stock will be offered for public subscription at this time.

The men responsible for the formation of the plans for the company were Howard Coffin, organizer of the National Aeronautic Association, chairman of the Aircraft Production Board during the War and one of the heads of the Hudson Motor Car Co., and C. M. Keys, president of the Curtiss Aeroplane and Motor Co. and well known financier of New York.

The officers of the new company are as follows: President, Howard E. Coffin; 1st Vice President, Charles L. Lawrance; 2nd Vice President, Wayne Chatfield Taylor, 3rd Vice President, Eugene W. Lewis; Secretary, Carl B. Fritsche, Treasurer, John J. Mitchell; Counsel, Chester W. Cuthell, New York, William F. McCracken, Chicago.

The Executive Committee is composed of C. M. Keys, chairman, Charles F. Glore, Earl H. Reynolds, Leonard Kennedy, William M. Metzger, Harold H. Emmons, C. T. Ludington, Howard E. Coffin.

The Board of Directors

Philip K. Wrigley, Chicago; Lester Armour, Chicago; Charles F. Glore, Chicago; John J. Mitchell, Chicago; Earl H. Reynolds, Chicago; C. M. Keys, New York; Leonard Kennedy, New York; Charles L. Lawrance, New York; Jeremiah Milbank, New York; Trowbridge Callaway, New York; William A. Rockefeller, New York; Howard E. Coffin, Detroit; Eugene W. Lewis, Detroit; George M. Holler, Detroit; Harold H. Emmons, Detroit; C. T. Ludington, Philadelphia; W. J. Austin, Cleveland; C. F. Kettering, Dayton; John Hays Hammond, Washington.

Others whose names have been mentioned as stockholders are E. G. Wilmer, New York, president, Goodyear Tire & Rubber Co.; A. A. Schlessinger, president, Steel & Tube Co. of America; Walter O. Briggs, president, Briggs Mfg. Co.; H. F. Pitcairn, Philadelphia; F. Trubee Davison, New York; Glenn H. Curtiss, New York; Richard F. Hoyt, New York, chairman of the Board, Wright Aeronautical Co.; Roy D. Chapin, chairman of the Board, Hudson Motor Car Co.

Col. Paul Henderson, General Manager

Col. Paul Henderson, in charge of the Air Mail, announced he would tender his resignation to President Coolidge next week, to be effective as of Aug. 1, when the new night Air Mail Service to Chicago will have been established.

Asked for his version of the organization of National Air Transport, Inc., President Coffin said:

"It is a very simple story. A group of men have associated themselves to do a much needed job with their own money. The establishment of an over-night air express service between Chicago and New York is a practical engineering task. The success of the trans-continental air mail in the last nine months is sufficient demonstration of this. There are difficulties to be met, of course, but the application of radio for determining the direction and position of an airplane in flight has removed much of the hazard formerly prevailing. Dependable night air transportation without radio is as im-

Courtesy Detroit Board of Commerce

Front Row, left to right: Wayne C. Taylor, Marshall Field, Glore, Ward & Co., Chicago; Col. Paul Henderson, who resigns as Second Assistant Postmaster General to become general manager of the line; John J. Mitchell, Jr., Illinois Merchants Bank, Chicago; C. M. Keys, president, Curtiss Aeroplane & Motor Co.; Daniel Schaefer, and Howard E. Coffin, of Detroit, who was elected president of the new company. Second row, left to right: Wm. E. Metzger, Detroit; Philip Wrigley, Chicago; Chester W. Cuthell, Philadelphia; Earl H. Reynolds Peoples Trust & Savings Bank, Chicago; Leonard Kennedy, Leonard Kennedy Co., New York, and Charles L. Lawrance, president, Wright Aeronautical Corp., New York. Upper rows, left to right: Charles F. Glore, Marshall Field, Glore, Ward & Co., Chicago; Wm. MacCracken, Chicago; Francis J. Tietsort, Detroit; C. M. McKenzie, Detroit; Carl B. Fritsche, of Detroit, named secretary of the company; W. J. Austin, Austin & Co., Cleveland; Wm. A. Mara, Detroit Board of Commerce, Detroit; Ralph H. Upson, Aircraft Development Corp., Detroit; Lieutenant Van Zandt, U. S. Air Service; Trowbridge Calloway, Calloway, Fish & Co., New York; C. T. Ludington, Philadelphia; W. T. Devlin, Philadelphia; George H. Klein, Clark, Evans, Bryant & Klein, Detroit; and D. S. Richards, Charles A. Parcells Co., Detroit

possible as would be reliable train operation without the telegraph.

"National Air Transport hopes to begin operation early this autumn confining its efforts at first to the transportation of express matter. After a definite and convincing physical demonstration of night operation has been made, it is likely also, that bank clearings, securities and air mail will be carried. It is not the present intention to give any consideration to the inauguration of passenger service.

"In spite of all that we read about the success of commercial air lines in Europe, the fact remains that not one is self-supporting today. Air line deficits in Europe are met by direct government subsidy. Such a plan is not looked upon in America as being economically sound. The National Air Transport is not founded on a government subsidy plan.

Howard E. Coffin

"It is proceeding on the theory that the New York-Chicago route, for instance, can, will and must pay its own way and that the cost of the service which it provides must be less than the advantage which the shipper derives because of the time saved.

Col. Paul Henderson

"It purposes to meet an existing demand for faster transportation service between America's two largest industrial centers at a price that will render the enterprise profitable. Otherwise the project would not be economically sound.

"It is hoped that when Congress again convenes, its attention will be directed to the enactment of Federal legislation for the purpose of establishing traffic regulations governing the operation of aircraft and extending such assistance as it already provides for water navigation. The Federal Government safeguards water navigation on the seas, rivers and Great Lakes with light houses, channel buoys, life saving stations, meteorological reports, ocean charts, harbors. With the advent of this new epoch-making means of transportation prompt steps should be taken by the Federal Government to safeguard aerial navigation by the establishment of air ports, emergency landing fields, beacon lights, weather reports and radio service. This is a public duty which cannot longer be ignored."

Colonel Henderson after the organization meeting said:

"The Board of Directors of the new corporation has adopted a resolution authorizing my appointment as general manager and requesting my acceptance. I have already accepted and my resignation will go to President Coolidge in a few days for the reason that for years I have been a firm believer in commercial aviation.

"My action in resigning as Second Assistant Postmaster General and in associating myself with Mr. Coffin and the other gentlemen who have organized the National Air Transport Corporation is a concrete expression of this belief.

"In a sense the New York-Chicago air line is a pioneer effort on the part of business men to operate commercial aircraft without government subsidies. In Europe air lines receive financial assistance from the various governments, but because subsidies have never been popular in this country assistance of this kind has not been extended to aircraft operators.

"Acronautics in America must stand on its own feet and succeed by reason of the service it renders.

"It is with regret that I plan to leave the Post Office Department. My associations there have been particularly pleasant and I am glad that it has been my privilege to play a part in the development and operation of the trans-continental Air Mail Service. I will leave to take up my new duties largely because of the fact that I see in this new field an opportunity to render a greater service."

It is learned that the operations main office of National Air Transport will be in Chicago and that the executive offices temporarily will be at suite No. 606 Penobscot Building, Detroit, which are the headquarters of Carl B. Fritsche, secretary of the corporation.

Clement M. Keys, president of the Curtiss Aeroplane & Motor Co., and chairman of the executive committee, all officers and directors of the new company, called attention to the fact that the charter filed at Wilmington, Del., contained this clause:

"If at any time, in the opinion of the Board of Directors of this corporation, a national emergency exists, the Board of Directors shall have the power to make available to the United States Government all or any part of the organization, equipment and facilities of this corporation, upon such terms and conditions as the directors deem proper, and every stockholder of this corporation, by the acceptance of his shares of stock herein, shall be deemed to consent to such action by the directors."

Clement M. Keys

It is expected that the company's New York-Chicago service will be inaugurated early in the fall. While a definite schedule has not as yet been prepared, it has been decided that planes will leave New York about 9:30 p. m. flying over a lighted airway and arriving in Chicago at approximately 5 a. m.

Freight and express despatched from New York late in the evening will be delivered in Chicago early the following morning, thus effecting a saving of at least one whole day.

National Air Transport, Inc., represents the first efforts on the part of private capital to operate a strictly commercial air line in America on a large scale and is evidence of the

fact, its officers declare, that business men believe the airplane has been developed to the point of practicability.

The New York-Chicago line is the first unit of a series of similar air lines which the company plans to place in operation.

Many of the newspaper accounts used the name of Henry or Edsel Ford in connection with the new company but enquiry confirms the statement recently made by Henry Ford that they are not interested in the new company financially or by representation. The Fords are operating their own air line and are planning extensions as rapidly as the Stout airplanes can be manufactured for the purpose.

Aeronautical Safety Code Completed

Final action in revising the American Aeronautical Safety Code was taken by the Sectional Committee at a meeting held at the Bureau of Standards, Washington, D. C., on April 23. The Chairman of the committee, H. M. Crane, who is president of the Society of Automotive Engineers, conducted the meeting, which was attended by twenty members, or alternates of its 33, as well as several members of subcommittees.

This project, which is sponsored by the Society of Automotive Engineers, Inc., and the U. S. Bureau of Standards, has been carried out by a Sectional Committee acting under the auspices of the American Engineering Standards Committee which is expected to approve the completed Code when the sponsors submit it to them. The Sectional Committee is representative of all interests concerned with safety in aeronautics. Several changes in the personnel of the committee have recently taken place. Lieut. Comdrs. R. R. Paunach and E. E Wilson succeed Lieut. Commanders Cecil and Leighton as representatives of the Bureau of Aeronautics, Navy Department; S. W. Sparrow has succeeded W. S. James as representative of the Bureau of Standards; H T. Kraft has been appointed alternate for A. L. Viles of the Rubber Association of America, and Carl F. Schorhy has been appointed alternate for C. G. Peterson of the National Aeronautic Association.

At the meeting on April 23, each part of the Code was gone over and suggestions for change which have been made since the printed drafts were issued were given consideration. Quite a number of minor changes were made and the revised draft of the Code was then adopted as a final document by the Sectional Committee. The Sectional Committee is, however, a continuing body and although the first edition has been completed by the action at this meeting, the committee will continue to function in making future revisions from time to time as they may appear to become necessary by progress in the art or as a result of experience in applying the requirements of the Code in commercial aviation.

No attempt will be made here to mention more than a few of the changes adopted by the committee since most of these changes were of minor importance. Among the decisions made, however, the following may be mentioned.

No definitions will be listed in the introductory part of the Code as at first intended, but the glossary of the National Advisory Committee for Aeronautics will be referred to in this connection by title only.

In Part 1, dealing with airplane design, the details for wood ribs as given in rule 112 (b) have been deleted.

In rule 123 where coloring for the identification of pipe is recommended, the committee decided upon orange to indicate fuel pipes, yellow for lubricating oil, white for water, admiralty green for air and red for fire entinguishing materials.

In rule 130 where the ultimate strength of spruce had been specified, this was omitted and a requirement made that stresses in wooden members be based on the timber tests of the U. S. Forests Products Laboratory. This involves the assumption of a 15 per cent moisture content and a 3 sec. duration of stress.

In rule 137 (a) specifying the assumed loads in the float supports of seaplanes, paragraph 4 was stricken out.

In the part on power plants, rule 211 dealing with tests of engines has a new paragraph added specifying that the engine shall be disassembled after the overspeed test and if any major parts are deemed to be unsafe for flying, the engine will be declared to have failed to pass the type test. The performance of the cooling system is specified in terms of the rise in temperature of the water, the rise being limited to 100 deg. Fahrenheit above that of the surrounding air.

In Part 4 dealing with signaling equipment, the U. S. Regulations for Radio will be inserted.

In Part 7 it is specified that pilots of aircraft carrying passengers should have had adequate experience with the particular type of craft used.

Splitdorf-Bethlehem Electrical Co. Formed

A combination of manufacturing as well as distributive interests in the automotive and radio worlds has been finally consummated after many months of planning, and the Splitdorf-Bethlehem Electrical Co. is the style of the new organization that will carry on and expand the businesses of the old Splitdorf Electrical Co. of Newark, N. J., and the Bethlehem Spark Plug Co., Inc., of Bethlehem, Pa.

The make-up of the board of directors will include, Charles M. Schwab, chairman of the Bethlehem Steel Corp. and dominant factor in the old Bethlehem Spark Plug Co. as well as of numerous other industrial enterprises; G. B. Alvord, a capitalist and brother of the late president of the Splitdorf Electrical Co.; C. E. Roraback, vice president of the Torrington Co., Torrington, Conn.; H. P. Ingels of Theodore Schulze & Co., New York bankers; Joseph Remick of Pillsbury Remick Co., Boston, Mass., and Charles F. Splitdorf.

The name of Splitdorf has been associated with the making of the ignition devices since the Civil War. Splitdorf coils, magnetos and spark plugs have been a vital factor in the progress of the automotive industry, and with the development of the radio art, their factory equipment and electrical knowledge fitted in with the manufacturing of head-sets, mica condensers, magnets, mouldings and other essential parts in demand by makers of complete units. The Splitdorf 5-tube tuned radio frequency receiving set was developed and has been built in limited numbers during the last few months and its reception attracted the interests of vast resources to the possible development of the allied interests. Important patents are a part of the Splitdorf holdings that make them a dominant figure in both.

Bethlehem spark plugs, wrenches and other automotive accessories with resources and interests in the raw material as well as the manufacturing worlds, places the consolidation in a peculiarly significant position for the bringing about of economies not only in manufacturing but in merchandising in what are daily becoming highly specialized fields.

Characteristics of a Single Float Seaplane During Take-Off

N.A.C.A. Report No. 209

At the request of the Bureau of Aeronautics, Navy Department, the National Advisory Committee for Aeronautics at Langley Field is investigating the planing and get-away characteristics of an N9H, a DT2 and an F5L, as representing, respectively, a single float, a double float and a boat type of seaplane. This report, by J. W. Crowley and K. M. Ronan, covers the investigation conducted on the N9H. The results show that a single float seaplane trims aft in taking off. Until a planing condition is reached the angle of attack is about 15 deg. and is only slightly affected by the controls. When planing it seeks a lower angle, but is controllable through a widening range, until at the take-off it is possible to obtain angles of 8 deg. to 15 deg. with corresponding speeds of 53 to 41 mi./hr. or about 40 per cent of the speed range. The point of greatest resistance occurs at about the highest angle or a pontoon planing angle of 9½ deg. and at a water speed of 24 mi./hr.

Report No. 209 can be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

The Amundsen Expedition

The Norwegian Aero Club's North Pole Expedition Starts for Pole and not Heard from

The North Pole expedition headed by Roald Amundsen and Lincoln Ellsworth, took off for its dash for the pole at 5:15 p. m. May 21. As we go to press no word has been received from them since. It was the original intention of the party to proceed to the pole, land, make some scientific observations and then fly back to the base at King's Bay, Spitzbergen. It is now believed that the party is returning to civilization on foot.

The expedition is under the auspices of the Norwegian Aero Club and was financed partly by them and partly by American capital. Two naval model Dornier Wals manufactured at Marina di Pisa in Italy formed the air equipment of the expedition. These machines are the same type that recently established twenty world's records and are equipped with two Rolls-Royce 370 hp. Eagle IX engines.

The party sailed from Tromso, Norway, on April 9 for Spitzbergen. The original intention was to assemble the planes at Kings Bay and then establish an advance base somewhere in the neighborhood of Danes Bay. About the first of May the Hobby proceded north to look for a suitable point but was blocked by the ice pack. The second week in May very nearly saw the start of the dash. The weather appeared favorable but before all the preparations could be made a very severe arctic storm set in. Finally the proper aerological situation arrived and the planes took off directly from King's Bay without any advance base.

The machines carried no radio as it was felt that it would be of little value in case of a forced landing in the far north. Also there seemed no way for relief to be sent them in case they did need it. Very complete supplies were taken along to enable the party to return on foot in case of need.

This expedition has aroused the greatest interest in the press all over the world. When it became apparent that the expedition had experienced some difficulty, numerous suggestions were made to start relief expeditions. The most interesting of these was to have one of the U. S. Navy airships proceed to the polar regions. The Navy Department has issued no statement regarding the feasibility of this or their plans. Several officers have pointed out that it would be necessary to have the Patoka proceed to the neighborhood of Etah to provide a base for operations. It was also suggested that the Navy-MacMillan expedition search for the party. If they have not returned by the time the ships reach Etah, this will very likely be done.

Before the hop-off Captain Amundsen issued this statement:

"Though our equipment has been pared to a minimum to enable our planes to carry enough fuel for twenty or more flying hours we are nevertheless carrying a novel and interesting assortment of luggage. The quantity of our personal clothing probably sets a record for an aerial expedition. Almost every article was made expressly for our dash to the North Pole.

"Our plane carries three days' food per man for consumption during the flight. There is also aboard thirty days' food per man, consisting of dried pemmican, hardtack, coffee and chocolate. This is for use in case we are forced to abandon the planes and strike out on foot for Northern Greenland, nearly 500 mi. from the Pole.

"We are also carrying a sledge laced with thongs to two ski-runners, a tent, a canvas boat, an ax, a wooden snow shovel, an ice anchor, smoke bombs, shotguns and rifles.

"There are an Austrian Mannlicher crack sporting rifle of 6.5 mm. bore and 200 rounds of ammunition in one plane, and a Springfield army rifle with a specially forged Pope barrel and 250 rounds of ammunition in the other plane. Each plane also carries a Colt automatic .45 with twenty-five rounds of ammunition. These revolvers will come in handy if a Polar bear crashes into our tent at night.

"The 16,000 postcards, sent by Americans and Europeans for transmission to the North Pole, will be carried in the dash and upon the return of the expedition will be mailed to the senders. We are also taking motion picture apparatus and a camera.

"The planes will fly toward the Pole at an altitude of between 2,000 and 2,300 ft., keeping to this low level because of the weight of the gasoline. We plan to return at from 5,000 to 6,500 ft. to enable the navigators to see Spitzbergen, a small spot to find in the Arctic world of ice.

"The planes will fly 320 ft. apart, side by side, to enable the navigators to indicate by arm signals. The arms will be raised once when the 81st latitude is crossed, twice at the 82d, three times at the 83d and so on until the 90th latitude, or the North Pole is reached. Special arm signals have also been arranged to indicate that the direction is being shifted and for the contingency that motor trouble compels a descent."

The following are the six members of the Amundsen-Ellsworth expedition.

Capt. Roald Amundsen is one of the leaders of the expedition and an observer in one of the planes. Amundsen, in 1912, was the first to reach the South Pole. He is also the discoverer of the North Magnetic Pole and was the first to traverse the Northwest Passage.

Lincoln Ellsworth is the sole American among the fliers. He is a co-leader with Amundsen in the expedition and, like the Norwegian is an observer in one of the planes. He was born in Chicago in 1880. He attended Columbia University, New York City and later McGill University, Montreal. He was a railroad engineer in Canada and a mining engineer in Northern Alaska. As a member of the United States Biological Survey he spent three years making a collection of mountain sheep from Mexico to the Yukon. He served as an instructor at the American Aviation School in Tours, France.

Hjalmar Riiser-Larsen, pilot, is thirty-five, married, and lives at Oslo. He is a lieutenant in the Norwegian Navy, which he entered in 1909. He studied airship construction and aviation in England.

Lief Dietrichson, pilot, is thirty-five, married, and lives at Horten, Norway. He is a lieutenant in the Norwegian Navy.

Oskar Omdahl, mechanic, is twenty-nine, single, and lives at Kristiansand, Norway. He has been associated with Amundsen for the past three years as an airplane pilot and mechanic. He was on the steamer Maud in 1922 when an attempt was made to have the ship drift from Alaska across the North Pole. He studied aviation at Mineola, L. I.

Carl Feucht, mechanic, is thirty-one, single and lives at Friedrichshafen, Germany. He is regarded as probably the premier living Dornier aero-mechanic. He served during the war on all fronts, including the Turkish, as a flight mechanic.

Air Mail Covers

The value of "covers" of mail carried in first transcontinental and over-ocean air flights is emphasized by a protest made to the *New York Times* by A. C. Roessler of East Orange, N. J., a dealer in stamps. Mr. Roessler complained that in published reports of the trip of the Los Angeles to Porto Rico it had been stated that 200 lb. of mail was carried, whereas only 30 lb. was transported. Inquiry at the Varick Street Post Office confirmed Mr. Roessler's statement.

"This correction is important," said Mr. Roessler, "as so many of the stamp dealers follow *The Times* and your quotation makes the covers six times as common as they really are."

It is stated that all the mail carried on the Los Angeles trips is now valuable. The first trip, says Mr. Roessler, is being quoted at $2 per cover. The second trip to Bermuda, he says, produced covers not quite so good, as 20,000 letters were carried. They now sell for 25 cents apiece, he adds, while on its return trip the Los Angeles carried letters now selling for $1 apiece. Those on the trip to Porto Rico, he estimates, will be worth at least $2.

The Morehouse Light Plane Engine

By HAROLD E. MOREHOUSE

Engine Design Branch, McCook Field

This engine, which will be known as the Model M80, has been designed and built to conform to the N.A.A. contest requirements for light plane engines. In the design of this engine particular attention has been paid to its simplicity, ruggedness and the ease of inspection and care. The cost has been kept as low as possible, consistent with the necessary requirements of such an engine, and, while it is admitted that an engine of even lighter weight and of higher output could be produced within the same cubic capacity, it has been the aim of the designer to produce an engine in which there are no new or untried features and one that would give a conservative output with the maximum possible degree of dependability. The writer wishes it understood that it represents the only Morehouse engine with which he is connected in any way.

Tested at McCook

The first engine was submitted to McCook Field for calibration tests, and the accompanying curve shows the results obtained. The photographs show the general arrangement of the engine quite clearly, and the overall dimensions are shown by the installation drawing. The engine has been so designed that a propeller reduction gear can be added when desired. The first experimental gear is now being built by Thomas L. Fawick of Racine, Wis., who is engaged in reduction and transmission gear manufacture. This will add about 14 lb. to the weight of the engine and will have a reduction ratio of 2.74 : 1.

The Morehouse 80 cu. in. engine is a two cylinder opposed four cycle air cooled type having a bore of 3.750 in. and a stroke of 3.620 in. The compression ratio is 5.0 : 1. The engine is rated at 28 hp. and 2500 normal r.p.m. Weight complete, as shown in photographs, 85 lb. (dry).

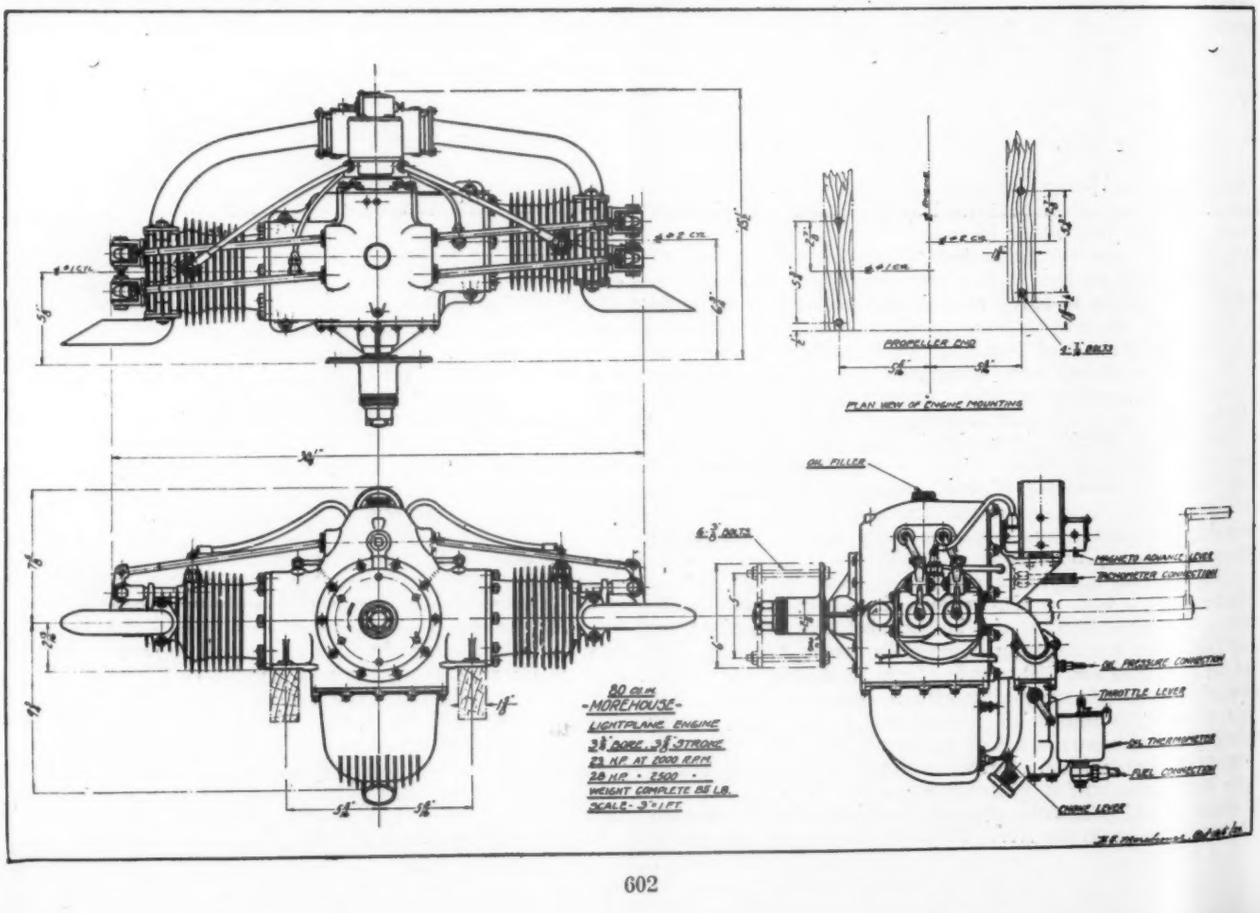
Following automobile practice, amply large plain bearings are used throughout the engine, together with a full pressure oiling system to all bearings, means being provided to regulate the oil pressure by adjustment.

The crankcase is a one-piece aluminum casting having a large opening at the front through which the crankshaft is assembled. The cylinders are attached to the crankcase with their holding down flanges about half way up the barrel, their location being made in the crankcase by two pilots, one at the flange and one at the end of the barrel. Closed compartments are thus formed when the cylinders are in place in the crankcase into which the by-pass oil from the pressure regulating valve is equally distributed. This oil, after serving to cool the lower half of the cylinder, is returned to the sump by separate passages. The camshaft, which is parallel to and above the crankshaft, is assembled in the crankcase from the rear. The counterbalanced crankshaft has two throws at 180 deg. and is made of S.A.E. 3240 steel. Narrow crankpins of large diameter are used in order to keep the offset between cylinders at a minimum.

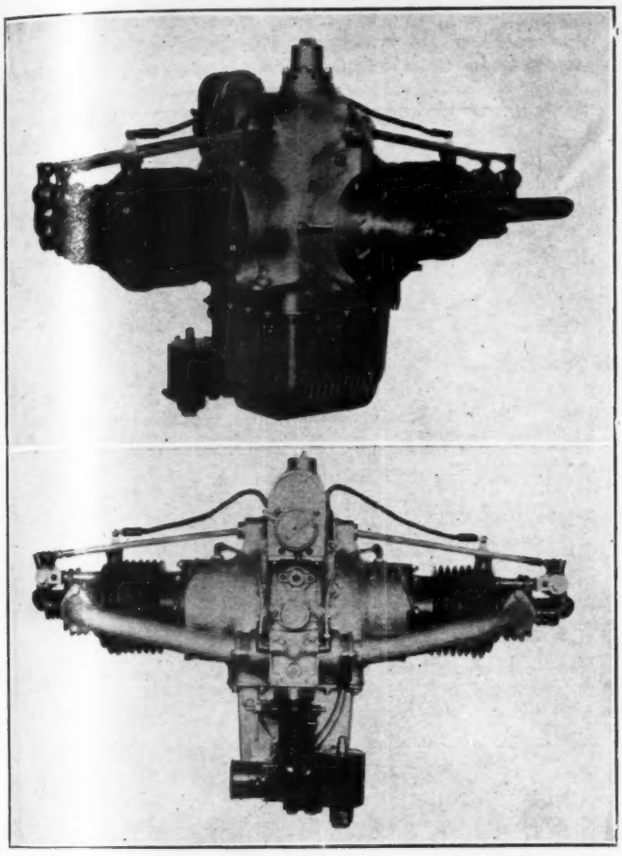
Duralumin Used

Forged duralumin connecting rods have shrunk-in bronze piston pin bushings and removable babbitted steel shells at the lower end. The flat head aluminum pistons are 3.125 in. long and have four 0.125 in. wide "Teetor" rings, three above the piston pin and one as a scraper at the bottom. The piston pins have bronze end plugs and are free to float in both the rod and piston.

The cylinders are of cast iron having integral cooling fins. There are two tulip shaped "Rich" cobalt chrome valves per cylinder seating directly in the head having 45 deg. seats 0.125 in. wide. The ports measure 1.375 in. in the clear and



the valve lift is 0.375 in. The cylinders are provided with removable valve guide bushings to permit of replacement. The valves are operated by push rods and rocker arms, the rockers being provided at the push rod end with means for adjusting tappet clearances, and a roller at the valve end. The push rods are sufficiently recessed in their sockets that they cannot come out in flight. The rockers are supported by individual brackets attached to the cylinder by a single stud.



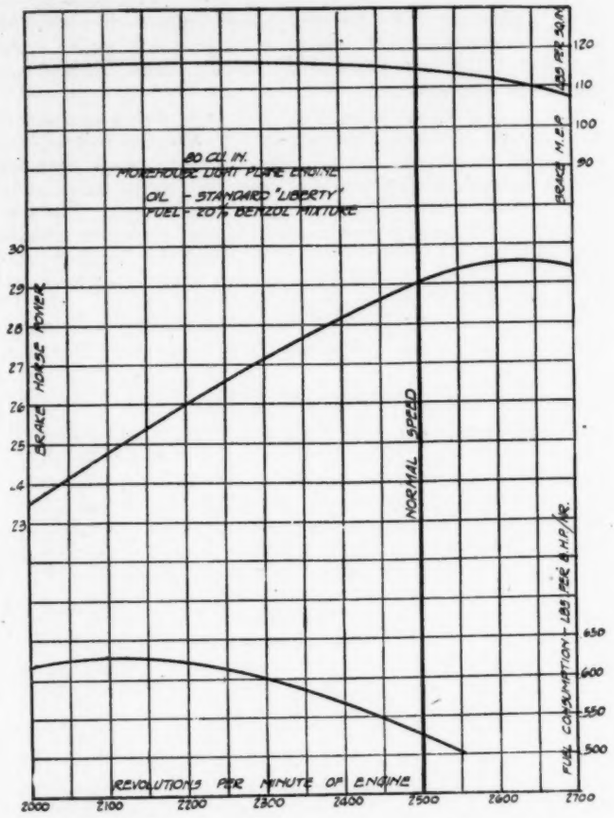
Front and rear views of the Morehouse Engine

Three spur gears comprise the timing gear train, the crankshaft gear driving an idler directly above at one-half engine speed which serves as the tachometer drive. The camshaft gear is driven from the idler at one to one ratio. The ignition drive is from the rear of the camshaft. A gear type oil pump is incorporated in the aluminum cover and is driven by a gear at one-half engine speed from the crankshaft. All accessories are conveniently located toward the rear on the cover which incloses the timing gears and are removed as an assembly. The camshaft, which is made of S.A.E. 6120 steel, has its gear and two cams integral. The cams having a base circle of 1.062 in. diameter and 0.500 in. face width operate flat ended followers directly in the crankcase. The valve timing is as follows: The inlet opens 10 deg. before top center and closes 50 deg. past bottom center, the exhaust opens 58 deg. before bottom center and closes 14 deg. past top center.

As in automobile practice, the aluminum oil sump is attached to the crankcase from below and is easily removable for the inspection of all interior parts. The oil is cooled by adequately finning the bottom of the sump and again by pumping it completely around the intake passage for a short distance either way at the center of the engine. To this casting is attached the special aluminum Stromberg 1.250 in. carburetor. Separate manifolds of tubing carry the mixture to the cylinders. About three quarts of oil is carried directly in the oil sump. An oil level indicator is provided in the oil sump, together with filtering screens, and provision is made for an oil thermometer.

Ignition is provided by a Scintilla Magneto firing a single spark plug in each cylinder. A combination breather and oil filler is mounted on the top of the crankcase, the breather being provided with a flange to which a tube may be attached leading out of the cowling to carry away any oil vapors.

Provision has been made for attaching a hand starting crank at the rear of the engine when desired. Two surfaces of ample area are provided along the under sides of the crankcase for mounting, using four 7/16 in. bolts. It is planned to build a small number of these engines this year.



Power and fuel consumption curves of the Morehouse Engine

High Speed Characteristics of Airfoils

N.A.C.A. Report No. 207

This report, by L. J. Briggs, G. F. Hull and H. L. Dryden deals with an experimental investigation of the aerodynamical characteristics of airfoils at high speeds, made at the request and with the financial assistance of the National Advisory Committee for Aeronautics. The investigation was carried out jointly by the Bureau of Standards and the Ordnance Department, United States Army, and was made possible through the courtesy of the Lynn Works of the General Electric Co., where a large centrifugal compressor was made available for the purpose.

Lift, drag and center of pressure measurements were made on six airfoils of the type used by the Air Service in propeller design, at speeds ranging from 550 to 1,000 ft./sec. The results show a definite limit to the speed at which airfoils may efficiently be used to produce lift, the lift coefficient decreasing and the drag coefficient increasing as the speed approaches the speed of sound.

The change in the lift coefficient is large for thick airfoil sections(camber ratio 0.14 to 0.20) and for high angles of attack. The change is not marked for thin sections (camber ratio 0.10) at low angles of attack, for the speed range employed.

At high speeds the center of pressure moves back toward the trailing edge of the airfoil as the speed increases.

Report No. 207 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

Preparing the Night Airway

By EARL D. OSBORN

In the fall of 1924 Colonel Henderson announced that there would be a night air mail service between New York and Chicago. On May 1, 1925, the beacons between Hadley Field and Bellefonte were tested out. The first trial flights between these points commenced in May. The next leg between Bellefonte and Cleveland is not quite so far advanced but trial flights should begin some time this month. The lighting of the course between Cleveland and Chicago was completed last summer.

The general public remembers that night flying experiments were carried on during the fall of 1923 between Chicago and Cheyenne. This part of the course is for the most part over flat or rolling country and was most suitable for what, at the time, was considered a very doubtful experiment. The week of trial flights proved that night flying on a regular schedule was possible and much was learned about the lighting needs. During the winter of 1923-1924 the details of the lighting and the establishment of emergency fields were carried out and on July 1, 1924, the Air Mail started its regular night service between Chicago and Cheyenne.

Important Route

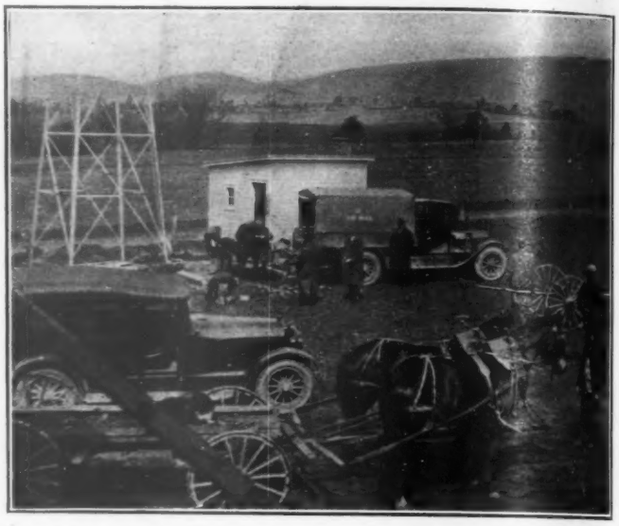
The route between New York and Chicago is the most important from the traffic point of view but the difficulties of night flying are very considerable. From the point of view of altitude the Alleghenies are mere hills as compared to the Rockies, the high points being only a little over 2,000 ft. The country, however, is very much cut up and on one part of the course there are seven ranges of hills in a little less than 50 mi. The hills are wooded and steep and the valleys are very rolling with few flat spaces. The greatest obstacle, of course, is fog and cloud, as in bad weather the clouds lie on the top of the hills.

To anybody motoring casually through the country it would seem impossible to find level landing fields at suitable intervals through the Alleghanies. J. E. Whitbeck, the superintendent of the Eastern Division, however, has not motored through the country in any casual style. For three years now he has been studying the country and looking for possible routes over a distance of 200 mi. north and south. The first move in the establishment of night flying was the moving of the eastern terminus from Garden City, L. I., to Hadley Field near New Brunswick, N. J. This not only saved some 50 mi. in distance with the same train time from New York, but it started the line out over some 80 mi. of flat country instead of over the rolling country to the north. Since last November the pilots have been flying this more southerly course and joining up with the old course at 110 mi. out.

Hills Difficult

Through the flatter country emergency landing fields are set at about 25 mi. intervals and if the plane has engine trouble the chances are pretty good that the pilot will find a fair place to put his ship down in. Through the hill country, however, there would be no chance to put a ship down safely and an attempt has been made to find emergency fields at 10 mi. intervals through the really bad stretches. The pilots flying the course complicated this to some extent as it is almost impossible to tell much about a field from the air, especially when flying on schedule. Superintendent Whitbeck has a wonderful knowledge of the country and applying this to the existing maps he has combed every mile of the country to locate possible fields. All through the winter, through snow and ice and mud, sometimes on foot, sometimes on horseback but mostly by auto the ground work of the Air Mail has been carried on. The result of this work has been the locating of really very decent emergency fields in country where locating such fields seemed almost impossible.

On the average the fields run somewhat larger than in the west, the smallest being 38 acres. Most of them are four way fields, although in certain places it was only possible to find two way fields, which, however, run parallel to the course. Most of the fields are placed on the high spots so that when flying at night there will be less danger of running into a hill in approaching them. Flying in valleys with high hills on either side is much more dangerous at night than during the day. Once the field is located the fun has just begun.



Staff Photo

Showing local contractor who erects the building, air mail truck doing the installation and Superintendent Whitbeck on a tour of inspection at one of the emergency fields

The land must be rented from the farmer and though most of them are willing to cooperate many of them want to haggle over the price and it is rare where one will make up his mind quickly. Incidentally the country is largely inhabited by the Pennsylvania Dutch and many of them cannot speak English as this language has only recently been taught in the rural schools. The land is leased from the farmers at from ten to twelve dollars per acre per year depending on the value of the land. The farm is planted to hay and during the day time the owner can graze cattle. Next the field must be smoothed and sometimes drained. The cutting of trees on the leased property is part of the lease terms, but trees on the approaches to the field must each be dickered for separately and some of the trees are very precious. Mr. Whitbeck seems to know all the farmers along the route as well as the original value and final sale price of most of the trees from Hadley Field to Bellefonte. In places whole orchards have been removed and on one field two tons of dynamite has been used to clear out stumps.

The grading of the fields and the building of the houses for the lighting plants is done by the local contractors, the actual installation, however, is done by Air Mail personnel, there being three trucks occupied in this work.

Caretakers

A caretaker must be found for each field whose duty is to run the beacon during the night and to light the boundry lights. The beacon consists of a 24 in. G.E. revolving searchlight mounted on top of a 50 ft. windmill searchlight which is usually set at an angle of 2.5 deg. with the horizon and revolves at the rate of six times per minute. The General Electric Co. are trying to work out a system whereby the beacon will pause when the beam is thrown along the line of the course. The beacon is placed on a 50 ft. windmill tower. The current is supplied by a Kohler power plant which con-

sists of a 4 cyl. engine driving a generator, but the storage battery system which is used on the western lines has been omitted. The boundary lights which are set at intervals of 100 yd. around the field are run by wet batteries and should burn every night for six months without change.

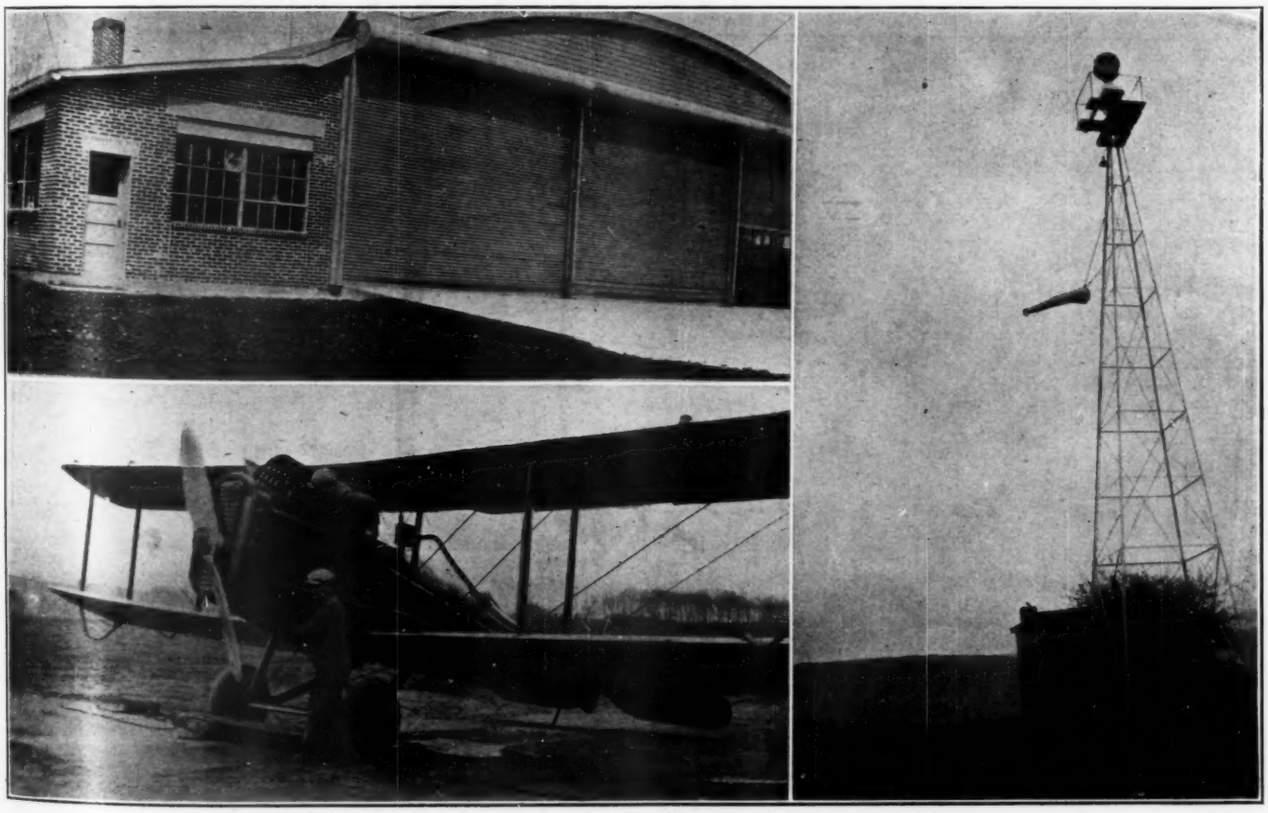
The placing of the beacons in relation to the field requires quite a little thought and at Sunbury the light has been placed on a hill nearly a mile from the course. Beacons have also been placed at points approximately half way between the fields. These "In Between" beacons are placed on the highest point of the hills and can be seen from the fields on both sides. Placing the beacons on the highest point of the hills means that they can not be seen when the clouds are down over the mountain tops. This will practically prevent night flying under such conditions but fortunately this condition does not occur very often. Flying at night the pilot does not, as a rule, see fog or cloud until he is actually in it. If he happens to switch on his landing lights he can see the fog ahead, but can not judge the size or shape and once in a fog the lights are worse than useless. As flying is at present, it would be too dangerous to fly with the clouds on the hill tops even though the valleys were clear.

Partly due to the rolling nature of the ground and partly due to the fact that they were not visible as far as the beacons, the small blinker lights which were placed every 3 mi. on the western section have been left off the Eastern section. The large beacons with a range of 150 mi. have also been discarded, these beacons were found unnecessary in clear weather and in foggy weather smaller beacons closer together have been found more satisfactory. All beacons and fields are to be linked by telephone for weather reports and these reports will be sent to other divisions from the radio stations which are located at each of the terminals. Incidentally, the fourteen radio stations which the Air Mail now has are rendering very valuable services in expediting operations and form the nucleus for much interesting development work. Planes on the Monmouth experimental line will be fitted with radio both for direction finding and for weather reports.

The emergency fields are not equipped with landing flood lights. The pilot will locate the field by the beacons and the boundaries by the smaller boundary lights, the planes themselves have landing lights on the tips of each wing and parachute flares and the fields are good enough so that the pilots should have no difficulty. A new terminal field has been built at Bellefonte about 2 mi. from the old field. It is much larger and is level with good approaches, though not ideal, it is certainly a great improvement. It will be fitted with a French B.B.T. flood light. The new hangar is completed and as the design and construction incorporates the past experience at the mail fields it is of great interest.

There is a crew of about ten men at Bellefonte, exclusive of the radio station, and as a rule it only takes 10 min. to refuel the plane, inspect it and start the pilot off on the next leg. On the day that the writer was there, however, J. D. Hill came in with a missing engine, the first that he had had during the year that he has been flying with the Air Mail. Inspection showed that a valve was sticking and that a new ship was necessary. It took 19 min. from the time Hill landed until the time that he was off again. Incidentally Hill had flown for some 120 mi. above the clouds on his way from Cleveland. When he came down through he was 6 mi. north of the course. Navigating above the clouds is being practised more and more by the pilots and some have become very proficient. Practical development along these lines can only be brought about by cooperation between the instrument makers and the pilots. The pilots who are trying it are certainly doing their share to help along the art of aerial transportation.

There is no definite date for the starting of the night service but it probably will be about the first of July. The day service will also be continued requiring a slight increase in the number of pilots.



Staff Photos

Upper left: Bellefonte hangar, the office and the roller doors. Lower left: Inspecting and servicing a plane at Bellefonte. Right: Beacon, wind cone, power house and boundary light at one of the emergency fields

The Douglas Transport

Description of the Douglas C1 Transport Plane Which Is Being Constructed for the Army

The latest production of the Douglas Company is the Army Transport C1. This plane is designed to carry six passengers and two pilots but can be adapted to carry such loads as a Liberty engine. The design is reminiscent of the World Cruisers and follows conventional lines. This plane was produced in response to a request for bids issued by the Air Service. The performance exceeds that required.

The wing spars are constructed in a conventional manner. They are of box section using spruce cap strips with two-ply spruce veneer on each side, together with the necessary spruce and plywood gussets, stiffeners and filler blocks. The wing ribs are of the girder type and made of spruce throughout except for the corner truss gussets which are three-ply mahogany veneer. The internal brace rods are swaged steel rods, anchored to duralumin fittings, bolted to the spars. The external wing bracing consists of rolled steel streamline rods and streamlined dural tube struts. The racking bracing is redundant, in order that the transverse fuselage rods at the wing beam stations may be omitted to provide easy passage through the fuselage.

Cellule

Folding wings may be provided for if required with a small increase of weight to take care of the hinges and extra fittings and panels. The wings consist of seven panels as follows: 2 upper outer sections, 1 upper center section, 2 lower outer sections, 2 lower inner sections. The lower inner sections, which carry the main gas tanks streamlined in them, and which have walkways built in, are, together with the side chassis, brace struts, detachable.

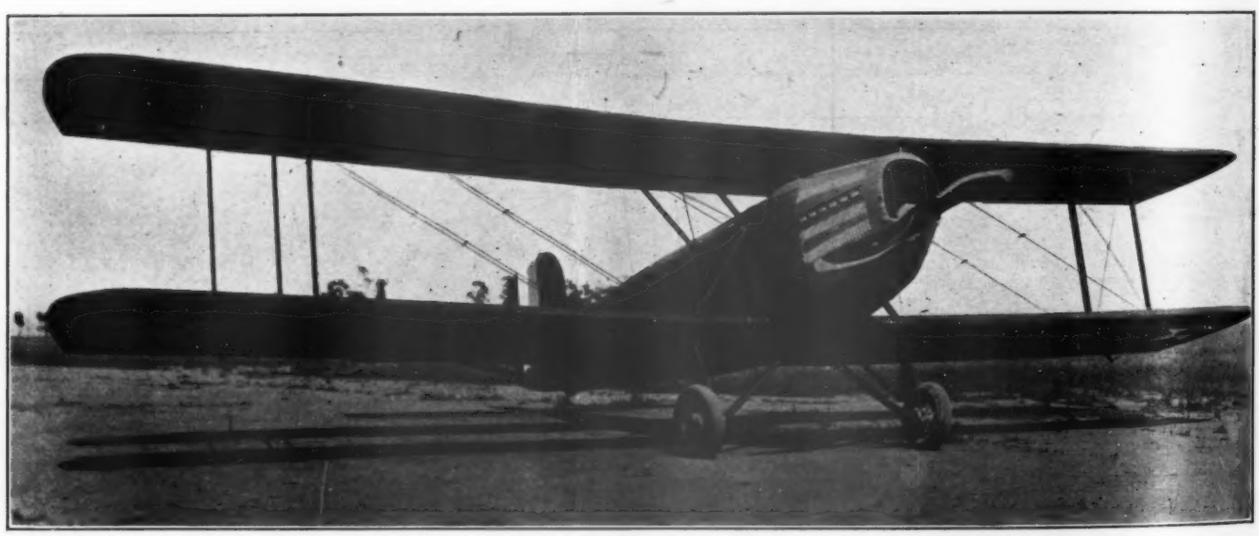
member type, made of heat treated chrome molybdenum tubing, and is connected suitably with the pilot's foot bar, to provide steering on the ground.

The fuselage is constructed of chrome molybdenum steel tubing and swaged steel tie rods. The joints are welded up in an approved manner. The engine section and pilot's bay, back to the front wing spar are covered, all four sides, with readily detachable aluminum cowling. The rest of the fuselage is covered with cotton over fairing srips of spruce, except for the doors, steps, etc.

Fuselage

The engine section carries the Liberty engine and a nose type radiator, and forms the pilot's cockpit. Proper fire bulkheads separate these sections. The pilot is placed on the left side of the fuselage, and the relief on the right. A single post and wheel type control is provided and the spacing of the seats, floor, cowling, etc. is so arranged that the two operators may change places in the air. Quick and easy entrance is had from the pilot's cockpit to the passenger compartment.

The passenger compartment has a clear cross sectional area of 46 in. width by 50 in. height. It is about 10 ft. long. Access from the ground to this compartment is through two doors at the sides and rear of the compartment. The pilot's compartment is easily reached through the passenger compartment. A door in the floor at the rear of the compartment permits of exit by parachute in the air or to the ground in a crash. The passengers' seats are readily removable to permit using this compartment for freight. The trussing in the



The Douglas C1 Transport Plane

The construction of the tail surfaces is conventional, the fin and stabilizer being of spruce beams and ribs, and the elevators and rudders of dural spars and spruce ribs. The stabilizer is adjustable in the air through the usual means of a hand wheel coupled to a worm and nut at the tail. The range provided to the stabilizer is from zero degrees with the wings to plus or minus three degrees with the wings.

The chassis is the conventional divided axle wide tread gear. The struts are streamlined chrome molybdenum steel tubes and the axle of the same material. The tires are 36 in. x 8 in. straight side airplane tires on wire wheels. Rubber cord provides the absorbing means. The tail skid is the single

horizontal plane of the lower longerons for two bays at the rear of the passenger compartment is so designed as to provide clearance for the lifting up into the fuselage from the ground of objects of the size of a Liberty engine. Two doors normally cover this hoist hole, which may be folded up into the fuselage and against the rear of the passenger compartment. A T rail may be mounted to the roof of the compartment for use in transferring heavy weights, such as a Liberty engine, forward to the center of the compartment, after being hoisted inside the fuselage. A hoist over the hoist opening in the bottom may be used to raise the article.

The covering over the longerons above the passenger com-

partment is designed to carry any baggage for the passengers. Doors in this cover permit placing of the baggage when on the ground. The size of the passenger or freight compartment is 4 x 4 x 10 ft. Six seats for passengers are normally provided with an extra seat for a reserve pilot but a seating capacity of eight people in the present enclosed compartment may be readily provided.

Aluminum tanks are used for fuel and oil. The oil tanks are located in the engine section. A 15 gal. gravity gasoline tank is located in the center section of the wings. Two 55 gal. main gas tanks are provided, one in each lower inner wing section. The gasoline feed system is by means of an air driven gear pump directly to the carburetor. A hand gas pump is installed to pump to the gravity tank for starting or to keep the gravity tank full to maintain flight in the event of a failure of the engine driven pump. A cartridge core nose type radiator together with suitably operative shutters constitute the cooling system.

Characteristics

Wing span	60 ft.
Overall length	36 ft.
Overall height	14 ft.
Wing area	800 sq. f..
Total dead load (including furnishings and electrical)	3900 lb.
125 gal. of gas	750 lb.
12½ gal. of oil	100 lb.
Crew of 7 passengers and pilot	1450 lb.
Miscellaneous	100 lb.
Total useful load	2400 lb.
Total normal pay load of 7 passengers	1260 lb.
Total normal pay load of 9 passengers	1620 lb.
Max. pay load (cargo)	2500 lb.
Gross weight normal load	6300 lb.
Gross weight 9 passenger load	6660 lb.
Gross weight max. pay load	7440 lb.

This method of loading would vary the wing loading from 7.9 to 9.3 lb./sq. ft.

Landing speed 53 mi./hr.—max. speed 110 to 120 mi./hr.

Ceiling 10,000 to 12,000 ft.

Aviators Meeting

The June meeting of the Aviators Post No. 743 was held in New York City on May 19. Due to the unavoidable absence of the Commander, C. S. Mathews, the Third Vice Commander, Henry S. Loomis, presided. After the transaction of the regular business of the post several members addressed the post on matters of interest.

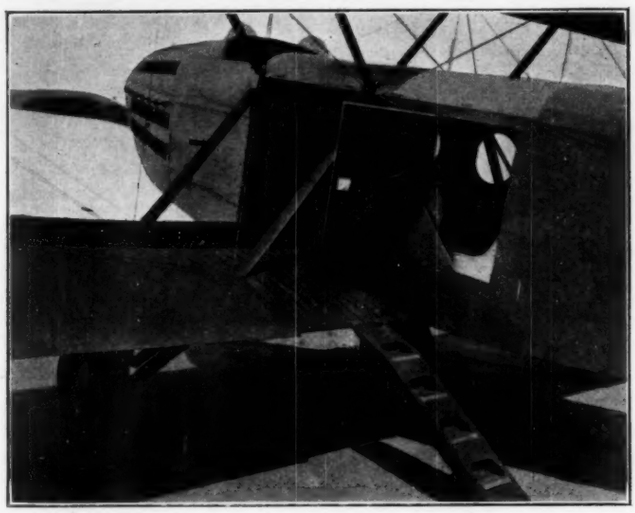
The first speaker was Maj. Wm. L. Moose of the Second Corps Area Headquarters. He pointed out that it is very easy for former officers to be commissioned in the reserve corps in the grade they held during the war. He said that accepting a reserve commission would not work any hardship as no active duty is required at the present time. The Major offered to form a reserve squadron to be composed of members of the post exclusively. In this connection, it will be remembered that this post is composed entirely of pilots and observers, a rating being essential to membership.

The next speaker was Father O'Sullivan, the popular skypilot of the A.E.F. squadrons. He described some of his experiences during his recent trip around the country visiting parents of former pilots. He was followed by Col. Harold E. Hartney who made a plea for commercial aviation. He stated that if this country had a healthy aeronautical industry we would be able to build up and maintain our air power. He also made the point that the telephone was derided by the telegraph companies and developed by outside interests and that, by analogy, one could not expect the older services to develop a new arm to its fullest extent.

Roscoe Turner of Alabama then gave a resume of his six years experience in commercial aviation. He made the point that the personal appearance of the pilot had a very considerable effect on prospects. For this reason he has worn a uniform consisting of a blue, vee neck blouse, Sam Browne belt, light breeches and boots. He said that he was very nearly forced out of business during the industrial depression a few years ago but managed to stick and that now he was getting along quite well and looked forward to a continual increase from now on.

A resolution of condolance to the mother of Lieut. James Jordon, who was killed in an airplane accident, May 17, was passed and ordered sent by telegraph. An amendment, proposed by Lieutenant Noble of the N.Y.N.G., added that Lieutenant Jordon was flying in the service of his country when killed.

The next meeting of this post will be at Miller Field, June 20 during the air meet of the National Guard Squadron. An effort will be made by the members of the squadron to give every one a hop.



The Cabin of the Douglas C1

Aviation Graduates Readily Placed

The last few months have shown a surprising activity in aviation, particularly commercial aviation such as the organization of a New York-Chicago air line by some of the powerful financial leaders in the country such as Henry Ford, C. M. Keys, Clarence Dillon, R. M. Hoyt and other men of equal prominence. The reflection of this activity is shown in recent experience at New York University. Since Jan. 5 something over 200 enquiries have been received by the Dean of the College of Engineering regarding the courses in Aeronautical Engineering and Industrial Aviation. These enquiries have come from every part of the country, from high school graduates, college students, engineering students, pilots draftsmen and others already engaged in aviation. The enquiries show the deepest interest. Another encouraging evidence of the rapid growth of aviation activities is the ready placing of New York University graduates in aeronautics. Nearly two months from graduation, 80 per cent of the class has been provided with suitable posts after graduation. John Bonforte will be connected with the Construction Department of the Air Mail. George De Bell will join the Design Department of the Huff Daland Co. at Ogdensburg, N. Y. George Titterton has under consideration an appointment as aeronautical engineer with the Government Air Service, with similar good openings for other men.

Japanese Flight

The Japanese Charge d'Affaires at Moscow on May 12 telegraphed to Tokio that the Soviet Government has declined to permit the proposed flight of two airplanes through Russia, on the way from Tokio to London, on a flight sponsored by the *Asahi*, a Tokio newspaper. The message said the Soviet Government would permit the Japanese aviators to fly only as far as Moscow.

The newspaper has announced plans for the planes to hop off on their flight of about 7,500 mi. during June in the hope that they may obtain further concession from the Russian Government after reaching Moscow and be permitted to continue the trip to London.

The Naval Air Battle of the Future

By M. H. McINTYRE

It is always of interest to read how Naval writers belittle the qualities and the use of aircraft. The following fanciful description of the beginning of a naval engagement was written by M. H. McIntyre from whose office in the Navy Department is issued, from time to time, naval publicity. After making a long argument to show that the success of the Around-the-World Flight resulted from the cooperation of the Navy he pictures an air battle in the future over the sea. After reading it, one wonders why the Navy carries along with it such hopelessly useless "adjuncts" as airplanes.—EDITOR.

A striking illustration of what the Navy thinks of the importance of aviation in modern warfare and to what extent it is being utilized will be given in the approaching Hawaiian maneuvers. In these, the greatest war games ever undertaken by the American Navy, 93 surface craft and 34 submarines will be employed while 130 airplanes will constitute the Air Force, more than the total number of surface and sub-surface craft.

Admiral E. W. Eberle, Chief of Naval Operations.

Aviation in the Navy must operate several thousand miles at sea. Aircraft must base on surface ships. The first shot fired in the next naval battle will be an airplane shot from the deck of a surface ship into the air. The battle in the air for air supremacy will be preliminary to the surface engagement which must be the final and conclusive argument.

Rear Admiral W. A. Moffett, Chief of the Bureau for Aeronautics.

We have pointed to the Around-the-World cruise as the best example of the difficulties of flying over the sea. This was a peace-time operation. How much more difficult will this operation be in war. Picture for a moment the situation which might arise shortly after the declaration of a war. An enemy fleet in the endeavor to cut our lines of communication and strangle our commerce will conceivably move against the Panama Canal. Our own fleet will move to the defense. They will probably meet somewhere at sea beyond the aid of shore defenses. Far out ahead of the fleet, submarines, destroyers and light cruisers will form the scouting line. Battle cruisers will support the line. Behind the battle cruisers, the main body will be concentrated in battle formation.

The absolute essential for each commander-in-chief is information as to the whereabout of the enemy. His scouts must do everything in their power to get this information and at the same time to deny the enemy this information as to their own forces. So far, we have not successfully put airplanes on submarines or destroyers, but we have them on scout cruisers. Far out on the vast reaches of the ocean, a pilot and observer will crawl into the seats of their fragile airplanes and be catapulted out over the sea. Behind the throb of a pulsing engine they will climb a mile or two in the air and cruise out over the trackless waste in search of the enemy. Within a half an hour they will have left their base behind them. Every beat of the engine takes them further away from safety. With nothing but a sluggish compass needle in a glass bowl to guide them, they drive on over the trackless waves.

If, now, they make a contact with the enemy, things begin to happen. They must get their information back to headquarters. The slender thread of our tiny radio is the one line of communication. As the observer pounds the key in a frantic effort to get this message through, enemy combat planes may dive to the attack. The pilot will attempt to seek safety in acrobatics and in flight. The radio operator will be striving to get this message through while being dived and looped and spun in dizzy gyrations. If we find it somewhat difficult to work our elaborate radio sets in the quiet of our homes, how much bigger task has this young aviator with the responsibility for the safety of the nation on his young shoulders ?

If, seeking safety in flight, our pilots start back to their her. She will, no doubt, have moved a hundred miles or so in the interim to carry out her part of the scouting problem. ship, they are confronted with a definite problem in finding Even when she finally appears a welcome sight on the horizon, our pilots will be confronted with the task of landing alongside in a heavy sea perhaps and in being hoisted aboard a rolling, pitching ship.

Suppose now the fleets have made contact. The air is full of combat planes endeavoring to fight off enemy aircraft. From a nearby carrier, a squadron of eighteen heavy bombers take the air. Behind laboring engines, the planes endeavor to climb to an altitude above the enemy anti-aircraft fire. They will fly in close formation, for their best defense is that of massed machine gun-fire. Enemy combat planes will dive into their midst and send some of them crashing to the sea below. Those that escape will drive on over the enemy battle fleet, struggling to seek that one point from which they can successfully launch their bombs. The enemy surface ships know this point as well as they, and as the bombers drive over the great vessels pitching and rolling in the white-capped sea, the panorama obscured by the smoke of funnels and guns, there will be plenty for the pilot to do to fly his ship and more for the observer to do in his struggle to adjust his sight to the wind, the speed and course of the enemy. These things he can only guess. As the planes near their vantage point, they will find themselves subjected to a barrage of bursting shrapnel that will cause them to roll and pitch dizzily. As they reach the point and drop their bombs, they can follow with their eyes the parabolic flight of their missiles. So can the enemy, and likewise by a quick touch of the rudder can the enemy turn aside. To be effective, the bombs must fall in a restricted area, which from an altitude above the barrages is hard enough to hit even in the peace-time with the target stationary. The chances for effective bomb hits are slim enough at any time.

Simultaneously with the departure of the bombing squadron, a torpedo plane squadron will take off from another carrier. This squadron will likewise be harassed by the enemy combat planes. Unlike the bombing plane, the torpedo plane cannot seek safety in height. The torpedoes must be dropped from a very low altitude. Above fifty feet the torpedo may wreck itself in the fall. Below ten feet, the splash of the torpedo as it hits the water may spill the airplane into the sea. With the sea running only fifteen feet high, the torpedo plane has very narrow limits for operation and it must drop its missile relatively close to a battle line which is hurling its broadside fire into the sea with the hope that the splashes may crash the attacking planes. Under such conditions, the torpedo plane pilot will be a busy man. His observer, charged with dropping the torpedo at the right moment, will find his hands full. A smoke screen will complicate the situation. Your aviator in combat is up against a somewhat different problem from that which he encounters in peace.

After the torpedoes are successfully launched, they have had habits which militate against them. Even when fired under favorable conditions, they run in circles, dive to the bottom, and jump out of the water in a most discouraging way. The target moving at high speed can avoid them with some success. In other words, it is one thing to deal with glittering generalities. It is another to deal with an active alert enemy.

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

The Morehouse Light Plane Engine

The Morehouse 80 cu. in. engine completed dynamometer tests last week at McCook Field. The tests, which we witnessed personally, were highly encouraging for light plane builders, for we realize that we have at last a real aeronautical engine at a reasonable price. The designer of the M-80 has taken the view that the light plane of the future is to be essentially a cross-country airplane, meeting hard, rough usage and varied weather conditions, having to operate on ordinary gas and oil, and not having very frequent overhauls.

The engine is of the two cylinder opposed air-cooled type. In general appearance it is rugged and compact. The cylinders are husky castings with well designed cooling fins for carrying the heat away from the valves and head. On the dynamometer when it was developing 20 hp. there were no overheating troubles although the air draft was not as great as would be the case when flying.

The experience of the English has given us ample material on the failure of experimental engines and their causes. The M-80 has received special attention at these points of possible failure and its ruggedness attests its probable length of life. Those who are opposed to the two cylinder type of engine were surprised to see the smoothness of the M-80 on the torque stand. There was very little vibration and the power impulses smoothed out much more evenly than in engines of the three cylinder type. The higher speed of operation gives it that "sewing machine" hum that is very different from the "put-put" we are used to in small engined planes.

The M-80 will lend itself very nicely to streamlined cowling. The oil reservoir and cooler which becomes the lower part of the crankcase takes up the natural curve of the under cowling, and the oil filler and breather at the top of the crankcase fairs in well with the top cowling. The cylinders must, of course, be kept in the maximum air stream and they are left uncowled at the sides. In some cases there has been provided a streamlining behind each cylinder, but this is doubtless valuable chiefly for looks. A very neat job of cowling a two cylinder opposed engine in a light plane may be remembered in the Parnall "Pixie" biplane. Two holes are cut in the cowling for the cylinders to project through and the slope of the cowl provides a larger frontal area of cylinder exposed to the propeller slip stream.

With the interest of light planes uppermost in his mind, Mr. Morehouse has put a price on these engines that is extremely close to the cost figures. He hopes to have as large a percentage as possible of the orders for the season received very soon so that proper arrangements can be made for manufacture and there will be few delays for those who are in a hurry for their engines.

In comparing this engine with others which are available to the light plane builder, one is struck with the fact that this is the only engine in this country that has successfully passed any official test or been through a reliability run. There are in fact very few foreign engines that have been successful in this way. At the Lympne competition last year, there was not a type that completed the tests without trouble. And yet the English engines have been considered very successful and many were exported to Germany for the light planes there. Our own light plane events last year were lacking in good engines. Our big problem in promoting light plane building has been constantly the need for a real aeronautical engine in the 80 cu. in. size. At last it has arrived, and we wish it every success.

Gliders Again

The new interest in gliders and soaring flight which is being evidenced in our requests for information, for drawings and details of a simple glider, marks the annual reawakening of the glider fever. To those who have never flown a glider this comes as the appeal of "natural flight." It is surprising how many there are who, having never flown, look to the glider rather than to powered craft for the satisfaction of their desire. To those who have flown gliders the temptation comes rather as the call of the sport royal. A group of test pilots were recently called upon to test a new landing skid for a glider. One after another they flew the machine—so utterly different from the high powered airplanes they were used to—and so engrossed did they become in "getting another hop" that it was presently necessary to call attention to the fact that this was a landing skid test and not a new form of sport to last all day long.

There is undoubtedly much to be gained from glider flights, and as yet we must remember that we have ahead of us the problem of bringing the glider record back to America. No one has ever found, outside of Kitty Hawk, any place in the United States where soaring flight is possible for any length of time. Beginning with the same difficulty in 1922 when they picked a very bad terrain for soaring at Clermont-Ferrand, the French have now discovered several places within the limits of France as well as in their possession across the Mediterranian where one can soar hours on end with no trouble at all.

One was impressed recently with the possibilities of similar feats in our ranges of hills in eastern Ohio and in western Virginia when flying over them from Dayton to Washington. In fact there was some temptation to come down in the old DH4 to see if one could discover any rising currents *a la Thoret*. If it had been a VE9 instead of a DH4 the stunt would certainly have been attempted, for the Vought must certainly have a far better gliding angle than the Hanriot HD10 of Lieutenant Thoret even though its actual sinking speed may be greater because of its greater forward speed. In front of the first range of high hills with a strong wind from the level country one should find soaring quite easy.

The glider will, of course, have a far wider range of appeal than the powered airplane flying as a glider, for gliders can be built by almost anyone, they cost very little, and they can be flown without a great deal of training.

There are all kinds of gliders for all kinds of flying and sport, from the sail glider built in Holland of sail cloth and spars, collapsible for transportation on a bicycle, to the very carefully built, highly efficient and expensive soaring machines of the German Technical Schools. One of the best gliders that was built in the United States during the period of the revival of soaring flight in 1922 was the M.I.T. glider No. 1. This glider flew successfully in France at the competition until it was damaged by an accident on takeoff. Slight changes have been made in the design commensurate with our increased knowledge of the factors governing most efficient gliding flight. The details of the design sufficient to enable anyone to build the glider strong and stable and controllable will be given in subsequent issues of AVIATION. It will be remembered that this glider was orignally described in AVIATION of Sept. 4, 1922. It was the result of a glider design competition held by the Aeronautical Engineering Society in 1921. The Society built the glider in Cambridge, Mass., in the spring of 1922, testing every important part in the Testing Materials Laboratories of the Massachusetts Institute of Technology. The first test flights were made in it at Hog Island near Ipswich, Mass., and it was shortly thereafter taken to France to represent this country in the French Glider Competition. Up to the time of its accident it was leading in every event and was making a strong bid for the prizes. It flew quite easily, was quite stable and maneuverable and was very easy to handle both in the air and on the ground.

AIRPORTS AND AIRWAYS

Dayton, Ohio

By Maurice C. Hutton

Johnson's Flying Service, the flying auxiliary of the Johnson Airplane and Supply company, is busy these days getting ready for the spring rush. Walter Lees, the veteran pilot and chief of the Johnson flying section for several years, has resigned and is now with the aeronautical section of the Packard Motor Corp. His place was filled by smiling Jack Laass, a former engineer and lineman at Wilbur Wright Field, and a war-time instructor at Carlstrom Field, Arcadia, Fla., and at Kelly Field. Clyde Emerick is also with the Johnson fliers, having come down from Columbus. Of late he has been unusually busy running the "Bumble Bee," better known as the DJ1 light airplane, through its paces.

The "Canary" has just been turned out of the shops again cleaned up and refined. We have not given it the once over yet, but reports are that the looks having been improved immensely by changing the cowling. There is unusual happiness among the Johnson brothers—Al and Jimmie—just now. Mrs. Johnson has presented Al with a beaming daughter, five pounds by the scales. Jimmie is up around Detroit somewhere. Reliable but unconfirmed reports indicate that he is, was, or is thinking of discarding the robes of a celibate. Best of luck, Jimmie !

Our mutual friend, Edmund T. Allen—we will call him a friend although he has succeeded in being among the missing every time we get out to McCook Field—had one of those unannounced but not unexpected spills that come to all who essay flying the other day. While coming in from a test flight—he is a test pilot in the McCook flying section—his mount began to discard parts in the air. According to reports reaching newspapers he did not have all day to choose a nice, open space, and the one his plane picked out wasn't so good. So finally he walked home with his parachute dangling behind him.

Donald Douglas is back in town at this writing watching out for his new transport or "cargo" plane as someone has named it. The job is not out on the line yet but gossip around the hangars hold that it is the neatest of the Douglas products to date and a much cleaner one than the world cruisers.

And that reminds us that Leigh Wade came back several days ago to pile up some flying time and address a meeting of the Dayton Chapter, N.A.A. The annual business meeting of the Chapter preceded his talk on the world flight at which time Orville Wright was elected honorary president; Frederick B. Patterson, former president of the N.A.A., president; Charles H. Paul, general manager of International Air Races, Inc., first vice president; John Ahlers, second vice president, and George B. Smith, secretary and treasurer.

Wilbur Wright Field has become unusually active so far as the news writers are concerned, and several fine stories have been worked up, thanks to the cordiality and cooperation of the commanding officer and his staff. The first story was that furnished by Maj. Hugh Kneer and Lieut. Malcolm Stewart who hopped off in a DH one moonlight night and broadcast a concert of music. Of course it didn't sound like the New York Symphony through WEAF but it was a novelty and one that was greatly enjoyed and appreciated by radio fans for many miles around Dayton. Lieutenant Stewart has "applause" cards to back up the statement. A small phonograph on his lap furnished the music.

More recently four non-commissioned men tried their hand at parachute. It turned out to be quite an entertainment for Fairfield employees. Sergt. D. L. McClaskey, Sergt. P. G. Smith and Pvt. D. W. Alexander, all of the 88th Observation Squadron, stepped off about 2,500 ft. Sergt. John A. Falls went them one better by diving off at 5,000 ft. and nonchalantly snapped photos with a kodak as he descended.

The first parachute repair section in the Army Air Service has been established at the Fairfield Depot which is responsible for a lot of parachute and jumping these days.

It doesn't look like Old Oak Flying Park will be among the aviation attractions in these parts this summer. Henry Elliott who flew his Jennie there each Sunday last season while C. G. Buton climbed over, under and above the old bus, has gone south with Lieut. Harold R. Harris on the boll weevil brigade. A dare devil without something to be daring with can attract about as much attention as these new two-piece bathing outfits. South Field, the old testing grounds of the Dayton Wright Co. now managed by Bennie Whelan and Howard Rinehart, is the scene of frequent joy riding flights.

Cleveland, Ohio

By Cy Caldwell

Col. Paul Henderson, Second Assistant Postmaster General in charge of Railroad and Air Mail, was in Cleveland recently to inspect the Municipal Landing Field which is being prepared for flying and on which the Air Mail is erecting several buildings.

Colonel Henderson then flew to Detroit with Air Mail Pilot Paul Collins, the trip taking only 1½ hr. as against 7 hr. by train. En route, Colonel Henderson inspected the new field from the air. Arrived at Detroit, he transacted his business, boarded a train for Washington, and was well on his way before the train he could have caught from Cleveland even was in Detroit.

Lieut. W. J. Hart, Jr., U.S.N., Inspector of Naval Aircraft for the Glenn L. Martin Plant, has been ordered to U.S.S. Argonne, Navy Yard, Mare Island, as engineer and repair officer of submarines. He won undying fame in Cleveland by giving a newspaper reporter an interview in which he (or the reporter for him) stated that if an anti-aircraft gunner was properly trained he should hit the aircraft with ease. Unfortunately, next day's paper contained an account of the anti-aircraft tests wherein the gunners had failed to hit anything. This was a bitter blow from which my poor friend never recovered. He pined visibly from that day, wore an apologetic look about the place, and seemed to be going into a decline from which he was rescued by orders to proceed to the submarines. May he find peace and forgetfulness among the dolphins. To paraphrase Shakespeare: The good men do is buried with them, while the mistakes they make are reported by Cy Caldwell.

The present inspector of naval aircraft who succeeded my poor friend Hart, thus sadly tossed back among the cod, is Lieut. L. B. Richardson (C.C.) U.S.N. A pilot who delights in flying planes in any position other than plain right side up and straight ahead. He packs a morbid craving for combat in the air and suggests that he leap into one of Glenn L. Martin's commercial planes while I crawl aboard another one and go up to do him battle. That he should challenge a poor old pelican like me shows the innate viciousness of the man. What little fight I ever had in me was extracted long before we finally wound up the watch on the Rhine. In fact by the time we got to the Rhine, I was so peaceful that a pet bunny standing beside me would, by comparison, have looked like a man-eating tiger. And yet, poor old barnyard fowl that I am, this hawk of the air must needs pick on me to practice warfare on. Well, thank kind Fate, the two planes look just alike, and no one can tell which is which, so after he has chased me all over the sky in mimic warfare I shall land and say to him, "My poor lad ! To think that I kept on your tail all the time ! Really, you must practice more." I shall leave him covered with confusion and stalk haughtily away.

My long and undistinguished career has been crowned with signal honor—I am appointed official observer for the issuance of pilot's licenses by the N.A.A.—So if any pilot here-

abouts wants a nice green license to show his friends and say, "Oh, look ! I'm a pilot !" all he has to do is call me up at the Glenn L. Martin Company and furnish me with transportation to his flying field—for I'm not going to wear out my poor old flat feet for him or anyone else.

In the Certificate of Flights it says "The candidate must be alone in the aircraft during tests." So far as I'm concerned, he will be. I may be with him in spirit, but that's all.

There is a further rich item: "In flights for Hydro-airplane certificate, starting from and landing on the water is permitted." Now isn't that nice of them ? They could have made it difficult by insisting that the seaplane take off from the roof of a house, say, or the top of a box car. But no, just from the water is all right. Really, if it hadn't been printed by the N.A.A. I'd think it was meant as a joke—but the N.A.A. joking—!

I'm a busy man and really haven't time for this new duty—but in justice to my grandchildren I felt I had to accept as the salary is simply fabulous.

P. S. I've consulted the dictionary and find I used the wrong word. Instead of fabulous, I should have written imaginary.

Fort Wayne, Ind.

Fort Wayne's aviation field was dedicated May 16 at 2:30 o'clock by Flight B, 309th Reserve Aero Squadron, at the tract recently leased by the Squadron, 3 mi. north of the city limits on the Lima road. Formation and trick flying by ten planes was the big event of the dedicatory ceremony.

Pilots included Arthur McDaniel and Roger Mensing, of Fort Wayne, the remainder coming from Fort Benjamin Harrison, Detroit, Chicago, St. Louis, Dayton, Kokomo and Bryan, Ohio.

At 2:30 o'clock, Mrs. F. I. Brown, of Illsley court, shattered a bottle of gasoline near the entrance to the 85-acre field. Mayor William J. Hosey expressed the appreciation of the city for the new field, and the dedication address was delivered by Attorney C. R. McNabb.

The following committees took part in the dedicatory program:

General Chairman—Floyd M. Showalter, captain Air Service Reserves.

Flying Operations—Clarence Cornish, lieutenant Air Service Reserves.

Traffic Regulations—Leland L. Hook, staff sergeant Air Service Reserves.

Tag Day Committee—Ford L. Fair, sergeant Air Service Reserves.

Printing Committee—Edwin L. Schaefer, private Air Service Reserves.

Refreshments—Carl Hatch, private Air Service Reserves.

San Antonio

E. B. Winship of the Southern Airways, Inc., of San Antonio, reports "a very interesting incident" at Stinson Field where they have been conducting a successful commercial aviation business.

This interesting incident was no less than the wiping out of their entire plant at this field, including airplanes, hangars and shops by a windstorm which swept San Antonio on May 9. The total damage is estimated at more than $50,000.

"We are at present engaged in the very pleasurable process of clearing away the wreckage, preparatory to rebuilding," says Mr. Winship.

These laconic remarks show the spirit behind the real pioneers—the spirit which amazed the world when the new San Francisco arose almost overnight from the ashes of the big fire.

In the meantime, while not quite "as usual," the business of the Southern Airways, Inc., is going on. "So as not to interfere with our cross country and photographic service here, we are bringing down six planes from our Dallas Branch. Our parts service will not be interfered with, as we can make shipment direct from our warehouses."

The following details are given in the *San Antonio Evening News:*

Stinson Field was a mass of tangled wreckage May 9 as the result of a storm, traveling at hurricane velocity, which blew hangars down on expensive airplanes, ripped the roofs from storage houses and carried away bodily a large workshop in which several engines were being repaired.

Fifteen airplanes, housed in hangars, or left unprotected on the field, were badly damaged. At the height of the storm, one plane which had been standing on the field, was lifted from the ground, blown over the top of a hangar and dropped, after a tail spin, on its nose on the South Loop concrete road.

Efforts of four men—two pilots and two student pilots, who were on the field—to save the plane from being carried away, nearly resulted in serious injury to all of them. As the four men held to the wings in an attempt to keep the plane from being blown away, they felt themselves being lifted into the air. They were several feet from the ground before they let go and dropped.

Sheets of galvanized metal from roofs and sides of hangars were torn off, crumpled up like tissue-paper, and scattered for a quarter of a mile across the field by the wind. One hangar was laid flat on the ground. The roof of another was blown off and the side of a third stove in. The workshop, a frame building which housed a number of engines, wings and accessories, was lifted away bodily, reduced to matchwood, and dropped on the South Loop road.

The four men who spent the night at the field and witnessed the destruction of the buildings are: W. W. Wedell and H. G. Mormon, pilots, and Jack Gobel and George Porter, student pilots.

Milwaukee, Wis.

By Daniel Kiser

With the increase in flying this month, quite an epidemic of crashes have resulted, both on the Airport and in this vicinity. The first of these happened two weeks ago when L. J. Holly, flying a Canuck belonging to Albert Padags, attempted to get back to the field with a missing engine. The plane settled into a field south of the Airport, breaking the propeller, chassis and one lower panel. Shortly afterward several automobiles visited the wreck, but no trace of the occupants were seen, and one of the boys remarked that the "Heinie was probably chasing Holly up the road with a piece of that broken prop." However, they were both discovered walking back to the hangars, and evidently at peace with each other. The plane is now rebuilt and in the air again.

The second crash occurred last Wednesday when Gilles Meisenheimer with a passenger, spun into the trees on the east boundary of the field while attempting to get back to the field after his motor had quit. The crash was probably due to attempting too flat a turn, on a very flat glide, resulting in a spin. Mr. Meisenheimer sustained an injury to his head while the passenger escaped without a scratch. The ship was a washout, and was a Canuck belonging to S. M. Cushman.

On Sunday, George Weins, flying L. Benson's Canuck did a very good business at Fond du Lac, Wis. returning Monday morning. Due to the extensive publicity given attempts to install a Lake Front Airport, interest in aviation has taken a jump, and several thousand cars visited the Airport, requiring several extra motorcycle policemen to handle the traffic. Quite a large number of people took rides with Daniel Kiser in a Canuck and Ralph Conant in a Hisso-Standard.

As I write this, news comes in of a crash at Westfield, Wis. in which Ralph Conant and a student were killed. Details of this are not available at the present time, but, it is rather a jolt to the boys at Milwaukee, as Mr. Conant made the Airport his headquarters, although his home was at Westfield.

A very interesting conversion of a TM Scout in which an OX has been installed, was delivered to Gilles Meisenheimer, and proved very satisfactory. The plane was demonstrated by Daniel Kiser, and Mr. Meisenheimer has been flying it nearly every day with good results. Visitors at the Airport during the past two weeks included an Army DH from Chanute Field, and a Canuck from Marionette, Mich., bound for Chicago, flown by Mr. Simmons, with a passenger. Ships from the Airport made numerous cross-country hops on various business such as advertising with signs on lower wings and photography.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Miller Field Meet Notes

One of the greatest concentrations of aircraft since the war will be seen at the New York Air Meet which will be held by the 27th Division Air Service, New York National Guard at Miller Field, Staten Island, Saturday, June 20, according to an announcement made by Maj. George A. Vaughn, Jr., D.S.C., D.F.C., commanding officer and second living American ace. Over a hundred Army, Navy, Marine Corps and civilian aircraft will be at the field when the meet opens.

Thirty planes will come from Mitchel Field, in addition to a squadron of observation planes from Langley Field, Va.; pursuit planes from Selfridge Field, Mount Clemens, Mich.; observation planes from Pope Field, S. C.; bombing planes from Aberdeen, Md.; experimental planes from McCook Field, Dayton, Ohio; bombing and observation planes from the Marine Flying Field at Quantico, Va.; and naval seaplanes, flying boats and bombers from Anacostia, D. C. The National Guard Air Service units in Connecticut, Maryland, Pennsylvania and Massachusetts will each send several planes to the field. The Naval Reserve Air Service will be represented by several machines. Most of the civilian aircraft concerns in the East will have one or more planes at the meet. Negotiations are under way with the Navy Department to have both the Los Angeles and Shenandoah fly up from Lakehurst.

There will be no admission charge to the field, and the visitors will see—among other events—parachute drops from speed planes flying at 120 mi./hr., more than a mile in the air. There will be stunt flying by many of America's best pilots and several aerial combats. Smoke screens will be laid from the big bombers and there will be many exhibitions of formation flying by all types of aircraft. A spectacular demonstration of Skywriting will also be shown. For those who like racing, there will be speed races by land and water planes. A grand stand is being built to accommodate the spectators. Undoubtedly one of the most thrilling races will be the one around the Statue of Liberty.

In commenting on this New York Air Meet, Major Vaughn said, "The officers and pilots of our organization are all New York men. We feel that the concentration of so many aircraft in the vicinity of New York will not only be of intense interest to the general public but of immense value to Army, Navy, and Marine Corps officers in ascertaining the best methods for the aerial defense of New York."

Fort Eustis Military Reservation

The three reservations near Lee Hall, Va., known as Fort Eustis, Balloon Observers' School, and Camp Wallace, respectively, have been designated in General Orders as "Fort Eustis Military Reservation."

Parachute Again Saves Life

The latest Air Service pilot to save his life through the use of the parachute is Lieut. J. Thad Johnson, of the 1st Pursuit Group, stationed at Selfridge Field, Mt. Clemens, Mich. Lieutenant Johnson was making a non-stop flight from Selfridge to Mitchel Field, N. Y., but through the perversity of fate engine trouble developed while flying over a mountainous and thickly wooded country.

Lieutenant Johnson's story of his adventure is as follows:

"I left my home airdrome at noon on April 10 in PW8 airplane, A.S. No. 24-219, for a non-stop flight to Mitchel Field, Long Island, N. Y.

"At Selfridge Field the weather was cloudy but visibility was good. This condition continued until I reached a point about 25 mi. west of Lockhaven, Pa., where clouds became denser and much lower and all low places were filled with fog. Several local rainstorms were encountered and clouds were about 300 ft. above tops of mountains. Still the visibility was fair enough to permit an accurate check on my course and not bad enough to make danger of hitting high peaks imminent. The last object checked on the map was the point where two railroads cross near Muncy, just west of the Susquehanna River. On crossing the Susquehanna River the fog lay so thick in the valley that it was impossible to see the river, but the shore was visible on each side.

Wide World Photo

One of the Aircraft Detectors of the C.A.C.

"When about ten miles from Muncy I first noticed the odor of hot oil. Looking at my oil pressure gage I saw the pressure had dropped to 100 lb., whereas it had been 120. Looking down at the floor of the cockpit I saw a large stream of oil coming back over same. I watched the oil pressure gage for about twenty seconds and saw that it was falling gradually. For thirty minutes I had not observed a single place where it was possible to land an airplane, and all the country as far as I could see was very mountainous and covered with heavy woods. Under these conditions I knew that it would be impossible to land plane without wrecking it, and that my chances of escaping serious injury would be very small. Since it was a question of wrecking the plane in any event, I decided it would be preferable to climb as high as possible through clouds before the loss of oil froze the motor and then jump.

"Looking in all directions the clouds seemed thinner to the north, so turning in that direction I stuck the nose of my plane into the clouds and began to climb through them as rapidly as possible. As I climbed I kept a very close watch on oil pressure gage and thermometer. The oil pressure continued to drop, but motor did not begin to heat until oil pressure had reached about 20 lb. At that point the tem-

perature went up rapidly and water and steam began coming out of the expansion tank. Almost immediately the motor stuck once and then started running with a very bad knock. In approximately twenty-five seconds it stuck again and again started running, but knocking increased. I looked at my oil pressure, saw that it stood at 10 lb., then at my thermometer and saw it was right up against the peg. My altimeter registered almost 10,000 ft. I immediately cut my switch and cut off gasoline, pulled the nose of the ship up until the propeller stopped running, unbuckled my belt, stood up in the seat holding the stick with my right hand, facing toward the left side of the plane. I put my left foot on the cowling while in this position and dived into space, aiming to miss the trailing edge of the wing about three feet. Due to the fact that I was out of sight of both earth and sky and in very dense clouds at the time I jumped I only saw plane for a brief instant when I made my first turn through the air.

"I counted five and started to pull ring to release parachute, but as I had never jumped before I was slightly confused and after searching vainly for the ring for what seemed to me about half a minute I realized I was searching on the right side instead of left. I was perfectly comfortable and did not feel any rush of air, any lack of control of all my muscles and faculties. I immediately reached to the left when I came to this realization and pulled rip cord. The parachute seemed to open almost the instant I touched the ring. Due to the fact that my harness was adjusted rather loosely, having been fitted to me for a winter flying suit, whereas I wore summer flying suit at this time, the opening gave me a very bad jerk and wrenched both hips to some extent. The webbing struck me on right side of face and nose and as the parachute opened, dazing me for just a moment.

"I estimate that it took me almost ten minutes to reach the ground after parachute opened. All this time I was in very dense clouds and part of the time in fairly heavy rain. I did not see the ground until I was about 300 ft. above it. I landed in a wild apple tree in the midst of a forest on top of a ridge which ran down the center of the valley between two mountains. I sustained no injury whatever in landing.

"After climbing down out of tree, I walked to the nearest house, which was about one and one-half miles away, and as I could get no transportation there, walked about two and one-half miles farther to Sonestown. There I got transportation to Muncy Valley, from which place I sent telegrams to the Commanding Officer, Selfridge Field, and Chief of Air Service. Later I received word that plane had fallen near Eagles Mere, Pa., and I thereupon telephoned the Commanding Officer of Middletown Air Intermediate Depot, requesting that an accident investigation officer be sent to the scene. He assured me that an officer would be sent next morning, so I returned to Eagles Mere and waited until the officer arrived the next day at about 11.30 a. m."

Tennessee Air Service Inspector

The annual armory inspection of the Air Service units of the Tennessee National Guard was recently made by Capt. A. N. Duncan, Inspector, who was particularly pleased with the Nashville squadron. The afternoon inspection was held at the flying field and a formation was flown first by the older pilots and then by the younger pilots. The performance put up by both was so good that it was difficult task to decide which one was the best. The evening inspection, which included the examination of men and various units, such as the Radio Section, the Machine Gun Section, and Intelligence Section, went off without a flaw. The Squadron and the Photo Section stood inspection with full pack equipment.

Air Mail Route Tested

Lieut. Vincent J. Meloy, Air Service Instructor, Tennessee National Guard, and Capt. Herbert Fox flew the last leg of the experimental Mail Flight from the Gulf to the Great Lakes on April 17. They landed at Bowman Field, Louisville, Ky., and went from there to the Air Mail Station at Maywood, Ill. The actual flying time from Nashville to Chicago was 3 hr. and 50 min.

When the transcontinental night Air Mail goes into effect, another test flight will be made, using the Air Mail Station at Cleveland, Ohio, as a terminus. This change was suggested by the Third Assistant Postmaster General, because both the East and West mail planes arrive at Cleveland at midnight, thus making this station the central point.

Army Air Orders

Maj. Leonard H. Drennan, A.S., Washington, to Sixth Ar. Corps, Chicago.

Capt. William F. Volandt, A.S., Bolling Field, to McCook Field.

First Lt. Oakley G. Kelly, A.S., detailed to additional duty as Com. Off., Pearson Field.

Capt. Wolcott P. Hayes, A.S., Chanute Field, to Mitchel Field.

Sec. Lieuts. Gordon T. Waite and Leslie F. Young, A.S., Adv. Fly. Sch., Kelly Field, to Scott Field.

Sgt. Joseph L. Myers, A.S., New York City, to Selfridge Field.

First Lt. Earle H. Tonkin, A.S., Fitzsimons Hospital, Denver, to Kelly Field.

First Lt. Leroy M. Wolfe, A.S., Boiling Field, to McCook Field.

Each of following officers, A.S., from assignment and duty at station indicated to McCook Field: Maj. Thomas DeW. Milling, Langley Field, Capt. Paul T. Bock, Marshall Field, First Lieuts. Robert G. Breene, Clinton F. Woolsey, Brooks Field, First Lieut. Carl F. Greene, Fairfield, First Lieut. Phillips Melville, Washington, First Lieut. John F. Whitely, Langley Field, First Lieut. David G. Lingle, Washington, First Lieut. Ennis C. Whitehead, Selfridge Field, Sec. Lieut. Glen T. Lampton, Pope Field.

First Lieut. Samuel C. Skemp, A.S., Chanute Field, to Bolling Field.

First Lieuts. Lester J. Maitland and George H. Burgess, A.S., Bolling Field, to McCook Field.

Resignation of Sec. Lieut. Harry Tatem Rowland, A.S. of his commission accepted.

Each of the following officers, A.S., from assignment and duty at station indicated to Langley Field: Maj. Horace H. Hickam, Kelly Field, Maj. Leo. G. Heffernan, Fort Bliss, Maj. Hugh J. Knerr, Fairfield, Capt. Lloyd L. Harvey, Kelly Field, Capt. Early E. W. Duncan, Langley Field, Capt. George C. Kenney, McCook Field.

First Lieut. Perry Wainer, A.S., Mitchel Field, to Chanute Field.

First Lieut. Ivan G. Moorman, A.S., Kelly Field, to McCook Field.

U. S. NAVAL AVIATION

Navy Air Orders

Comdr. Theodore G. Ellyson, det. Nav. Mission to Brazil, to Aircraft Sqd., Setg. Flt.

Ensign Horace B. Butterfield, det. USS Ark. to temp. duty under instr. aviation Nav. Air. Sta., Pensacola.

Lt. (jg) Francis J. McKenna det. USS John D. Edwards to temp. duty Nav. Air Sta.,, Pensacola.

Lt. William M. McDade det. Nav. A.S., Pensacola, to Aircraft Sqd. Battle Flt.

Lt. (jg) John J. Lenhart det. Nav. A. Sta., Pensacola to Aircraft Sqd. Setg. Flt.

Lt. (jg) Stanley J. Michael det. Nav. A. Sta., Pensacola to Aircraft Sqd. Battle Flt.

Lt. (jg) James B. Voit det. Nav. A. Sta., Pensacola, to Aircraft Sqd., Setg. Flt.

Ensigns Clarke H. Lewis, Alvin I. Malstrom, Alfred R. Mead, Albert K. Morehouse, Robert W. Morse det. Nav. A. Sta., Pensacola to Aircraft Sqd., Battle Flt., Setg. Flt.

Ensign Herschel A. Smith det. Nav. Air Sta., Pensacola, to Aircraft Sqd., Battle Flt.

Ensigns Humphrey W. Toomey, William B. Whaley, John P. Whitney det. Nav. A. Sta., Pensacola, to Aircraft Sqd., Setg. Flt.

Lieut. James C. Masters det. Bu. S. & A. to Aircraft Sqd., Battle Flt.

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Publisher's News Letter

Asst. Secretary of War Dwight F. Davis recently made some very direct statements regarding Industrial Preparedness. Some of the views have a particular bearing on aerial preparedness such as: "Our plans strive to provide the cheapest and best insurance against war that a nation can carry;" "Industry alone cannot win wars but it may lose them;" "It is better to have enough of an inferior article than none of a superior;" "If we utilize industry intelligently there will be little need for new facilities;" "Our requirements should be kept up-to-date in terms intelligible to industry showing our needs from month to month;" "Whenever practicable commercial standards should be adopted for munitions."

* * * *

Applied to the aeronautical industry this would appear to mean that aircraft should be used where they are the cheapest and best insurance for the peace of a country; that the aeronautical industry cannot win a war by itself but it might be the cause of our losing a war; that it is better to have a large number of inferior airplanes and engines than none of a superior type; if the government utilizes the facilities of the aeronautical industry intelligently there will be little need to increase its scope; our needs for aircraft should be clearly stated so that the aeronautical industry will know the government's needs from month to month, and lastly, whenever practicable, commercial standards should be adopted for aircraft. This application of general principles to the aeronautical industry has some interesting possiblities.

* * * *

Take the question of what is the cheapest form of war insurance. Everyone who knows his foreign aviation will immediately point to Irak where the British are defending and policing a country with air forces at a less cost than they could with military forces. Then the popular notion that aircraft are cheaper than battleships would come up for still further discussion. The aircraft industry has had all the bad things possible said about it but no one has ever accused it of losing the war. Secretary Davis thinks that this is possible. If it ever happens the blame can be placed where it belongs, on the doorstep of the higher-ups in the Army and the Navy who have held back the development of aviation in this country.

* * * *

While it is true that it is better to have enough of an inferior article than none of a superior type, it is poor economy when it comes to aircraft for warfare. This principle may hold true with regard to bombing and reconnaissance types but as pursuit planes are the criterion of all war aviation, the test comes in this classification. Here the best will dominate and numbers of inferior types be hopelessly defeated. Applied to this country that leads the world in the ability to produce pursuit planes, there is only one course to follow; get the best, enough of them and lead the world.

* * * *

As to the capacity of the present aircraft industry to produce in wartime a sufficient supply of airplanes, there can be no question, providing that "we utilize industry intelligently." When the engine problem is considered we have not the same certainty. If a continuing program of requirements were known even to the Services themselves plans could be made for an enlargement in time of trouble. But as it is managed now, neither the Services nor the aircraft industry can make plans for more than the fiscal year. This is one of the shortcomings of our system of government and is difficult to change. It is the one point where there is unanimity of opinion everywhere except in Congress. As far as the aircraft industry knowing the requirements of the government "month by month," the Secretary must have been thinking of some other supply than aeronautical. There never has been a program for airplane procurement that extended longer than a few months and as this was usually predicated on the bidding system, a chaotic condition has existed that has brought the aircraft industry to its present state of uncertainty. At any rate Secretary Davis has spoken toward an ideal condition. Application is now the need.

* * * *

In this connection, it is well to center a little more interest in Assistant Secretary Davis during the present year. He is one of the best friends of aviation in Administration circles. He has been outspoken in his opinions regarding the possible use of aircraft in war. So vividly did he picture its employment that Brig. Gen. Hugh Drum when asked his opinion of the portrayal gave the General Staff opinion succinctly when he characterized it as "Rot." This remark will rank with Secretary Daniels's famous offer to let General Mitchell drop bombs on him on a battleship. Secretary Davis may live to see his ideas vindicated. At any rate his interest in aviation is sincere and informed.—L.D.G.

Batavia,
November 27, 1924.

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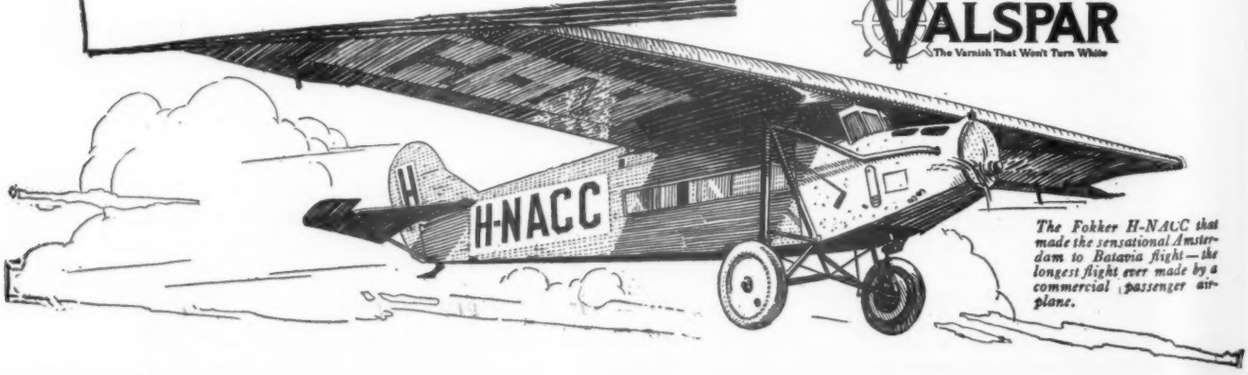

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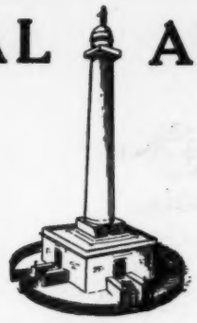

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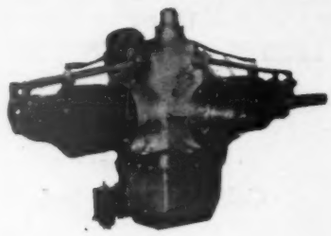

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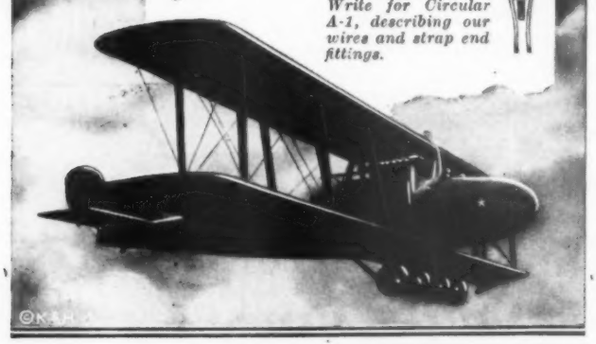

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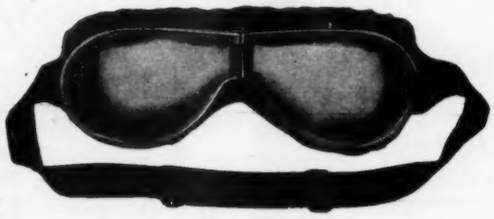

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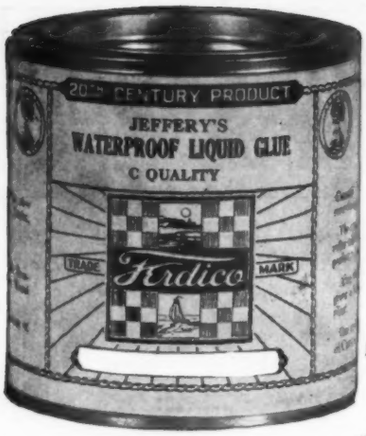

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